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THE ZOOLOGIST:

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POPULAR MONTHLY MAGAZINE

OF

NATURAL HISTORY

AND

JOURNAL FOR RECORDING FACTS & ANECDOTES

RELATING TO

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**THEIR HABITS, FOOD, RETREATS, OCCASIONAL APPEARANCE,
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Nos. CLXXI. & CLXXII.

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A correspondent has pointed out a passage in the foregoing advertisement, which, as published in the December number, was open to misconstruction. The period for receiving prepaid subscriptions of 12s. for the year is therefore prolonged to the 17th of January, after which prepaid subscriptions for the year must be 13s. until the publication of a second double number, when 14s. must be paid.

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I have to apologize for the holding over of a great number of valuable papers; the principal of these are by

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THE ZOOLOGIST

FOR 1857.

Stray Notes from an Ornithologist's Diary during the past Summer.

By MURRAY A. MATTHEWS, Esq.

IN the neighbourhood of Barnstaple, North Devon, during the last eighteen months, specimens of the rarer British birds have occurred more frequently than, perhaps, in any other part of England for the same period. It is my opinion that were an active and enthusiastic ornithologist to establish himself in this quarter, and work it diligently, many new and important facts would be collected relative to the habits and economy of some of our scarcer birds with which the bird-studying world is as yet but imperfectly acquainted. The situation of Barnstaple and the country round it is one peculiarly fitted to attract any birds which may be straggling westwards. We have a most diversified country: hills, fallow-lands, dry heath, elevated moors, extensive rushy marshes, and where the Taw below Barnstaple flows broad and tidal, previous to its uniting with the Torridge at Appledore and joining the Bristol channel, we have broad sandy flats, which are left dry as the tide retreats, and here and there soft beds of ooze, formed from that alluvial deposit which the Taw has rolled down through many a fertile meadow on its way from the wilds of Dartmoor. And where the two rivers meet there is a large tract of dry and barren sandhills, known favourably some years ago to entomologists as a sure haunt of *Deilephila Euphorbiæ*, bordered landwards by an extensive fenny flat called the Braunton Marshes. Above Barnstaple, again, there are the Tawton Marshes, in which, in October, 1855, a fine specimen of the great gray shrike (*Lanius excubitor*) was killed by a farmer: this bird is now in my collection. In these marshes also, during the severe weather last January, several fine specimens of the bittern were shot. A little way to the south of Barnstaple, near a village of the



name of Lankey, a fine adult male of the mountain finch (*Fringilla montifringilla*) was shot by a farm-labourer as early as the 20th of July: this is in itself a valuable fact, as it might in some way countenance the supposition that this beautiful species occasionally breeds in our southern counties. It is a bird, according to the late Mr. Yarrell, excessively rare as a summer visitant, and far from commonly met with even in the winter months. The specimen in question was in very handsome plumage, and it was its gay appearance that attracted the notice of the man who shot it, as it was flying about a hedge in company with some yellow buntings and greenfinches.

The great capture near Barnstaple this season, to detail which I have been chiefly led to connect together these rambling notes, has been the cream-coloured courser (*Charadrius cursorius*), which was shot by the Rev. J. Landon, of Braunton, early in the last week of the past October: this is the first occurrence of this rare straggler to Europe in North Devon, and, I believe, anywhere in the south-western corner of England: the bird was met with in the Braunton Marshes, and was fired at several times by the Rev. J. Landon and his friend before they succeeded in killing it: Mr. Yarrell mentions but four instances of its occurrence in the British islands, and these are at very wide intervals. Two specimens of the peregrine falcon (*Falco peregrinus*) have been secured in our neighbourhood this year. I have myself shot several individuals of the curlew sandpiper (*Tringa subarquata*) by the side of the Taw this summer, or on its sandy flats during low water: two of these were adult males in fine summer plumage; the first I killed on the 14th of August, the second out of a small flock as late as the 6th of September; the last, singular to relate, was in far brighter plumage than the one I obtained in August, and had its breast and belly marked with the rich chestnut-red which distinguishes this bird at once from any other of the genus: it gave no symptoms of having commenced the autumn moult, while the dunlins had some time previously been changing the gay colours in which they appear during the bright summer months for that less conspicuous but far warmer dress in which they resist the icy winter winds: owing to the singular richness of the plumage, together with the circumstance of its having been obtained so late in the season, I have considered this specimen of some little value, and have presented it to the Museum of the Ashmolean Society at Oxford. I have had many opportunities this summer of observing the habits of this beautiful little sandpiper, and consider it one of the most graceful of the genus: it generally associates with the ringed plover and dunlin,

never in any numbers, and can readily be distinguished from them by its longer legs and more upright carriage. A flock composed entirely of curlew sandpipers is very rarely to be observed, and I have only once noticed one; there were in it about ten of the birds, the greatest number I ever saw together: they are wilder than the common dunlin, and, as the flock in which they are is approached, are the first to take wing. I was much interested one afternoon, upon wounding a bird of this species in the wing, to find that it could swim; for, upon my giving it chase, it swam readily across a small channel of the river, with as much grace and ease as our well known *Totanus hypoleucos*. The female of the curlew sandpiper is a larger bird than the male.

This season the knot sandpipers have been very plentiful with us: they made their first appearance on the 22nd of August, in company with a large flock of dunlins, and a few days afterwards were to be seen by themselves in great numbers. These birds are foolishly tame: as one advances towards them they have a peculiar custom of turning round and presenting the whole side of their bodies towards one, and, after they have all veered round, of remaining motionless until one gets quite near to the flock: they watch you narrowly, however, all the time, and seem to be meditating as to what strange thing it may be that is approaching them; their decision, unfortunately for themselves, generally would appear to be that you are drawing nigh to them with none but friendly intentions, as they do not ever think of taking wing and retreating until, as it often happens, the terrible gun has sent forth its destructive volley, and numbers of them lie dead or wounded upon the sands. As the flock is on wing the birds can be readily recognised by their peculiar flight: this is slow, in comparison with that of the other sandpipers, and generally low over the surface of the sands: upon observing the direction for which the birds are making, it is no difficult matter, either by running or walking fast, to intercept them, when a most destructive shot can be taken at them, as they will not alter their course the least upon the enemy's approach.

On the afternoon of the same day in which I first noticed the arrival of the knots, I was attracted, on passing a flock of dunlins, by hearing a strange and peculiarly shrill whistle proceeding from some bird among them: curiosity prompted me to fire, and I had the satisfaction of finding that I had killed a beautiful specimen of the little stint (*Tringa minuta*), still in summer plumage: this little bird is excessively rare along the western coast of England, and has but been noticed once or twice in the South of Devonshire. The bartailed godwit has been this season unusually plentiful, and great numbers of them have been shot:

after the severe gales of the 26th and 27th of September they were driven into the river in large flocks, and were easily approached: they have singular tactics as one walks towards them: while they feed they are generally scattered over the ooze in a long irregular line; as one approaches them the birds on the flank sides of the flock take wing, wheel once or twice over the others, uttering all the while their peculiar cry, and finally settle closer together among the rest: this manœuvre is once or twice repeated as one draws nearer to them, and each time they rise and settle they form themselves into a thicker body, and, if they remain on the ground until one arrives within a reasonable distance for a shot, a great number can be always laid low by a single discharge.

One stormy afternoon, on taking my usual walk along the river, I observed a dark-coloured tern hovering sedulously in quest of small fish over the shallows which were left by the retiring tide: it was not without some wading that I succeeded at last in obtaining a shot at and killing the bird, when I found it to be the lesser tern (*Sterna minuta*), a species which, although I believe far from uncommon along our eastern coast, is but rarely seen so far west as Devonshire.

On the 23rd of September, when walking near the water's edge, I remarked a light-coloured bird, which suddenly flew swiftly past me, and, alighting on the water a little further on, commenced swimming on the crests of the waves, appearing as it rose and fell again very much like a miniature duck: I at once saw that the bird before me could be no other than the gray phalarope (*Phalaropus lobatus*), which the northern gales had driven southwards from his home along the Norwegian coasts. I enjoyed the sight for some little time, and then, having advanced and shot the bird, found it, just as I had imagined, a very fine specimen in a beautiful state of intermediate plumage. A few days afterwards, when sailing on the river, I observed another, but the wind blowing fresh at the time, I was unable to tack about so as to get anywhere near it.

MURRAY A. MATTHEWS.

Merton College, Oxford.

Birds of the Crimea. By THOMAS BLAKISTON, Esq.,
Lieut. Royal Artillery.

THE following notes are made up from my journal kept while serving with the Army of the East during twelve months in 1855 and 1856; but, before commencing, it will be as well to say that the observations refer mostly to the neighbourhood of Sebastopol, and there-

fore must not be considered as referring to the Crimea generally, nor must the list be taken as including anything near the whole of the birds which inhabit that country; for, in the summer, living in a single bell-tent in very hot weather, ever expecting to be on the move, and in the winter with plenty of other work, and few conveniences or books of reference, little could be expected.

It is needless to say much concerning the country; suffice that, taken generally, the peninsula may be considered a continuation of the plains or "steppes" of Southern Russia, the only mountainous or even hilly parts being the south and south-east. The climate appears to be very variable in different years.

BIRDS OF PREY.

Of the vultures I have never observed but the one species, the griffon vulture (*Vultur fulvus*), which was numerous during the year, and my friend Dr. William Carte considers that their numbers are greatest during the summer, and he also remarks that they seldom occurred in cloudy or foggy weather: he was lucky enough to kill and preserve a specimen, which, together with many others from the same country, he has liberally presented to the Royal Dublin Society. Any one who would wish to inspect living specimens, can do so at the Gardens of the Zoological Society, where are two fine birds, presented by the Commandant of Balaclava, which were taken near the Monastery of St. George. There were numerous opportunities of observing these birds feeding on carrion, of which there was little want, in the shape of dead horses, mules, cattle and sheep: I have seen as many as fifty together at a time. Many a time have I waited in the high cliffs overhanging the Euxine for a close shot at them without success, and their appearance, when flying below one, is of a uniform light ash-brown, except the wing feathers, which appear nearly black. I note this, because I consider with Bewick that it is a great point in Natural History to know the appearance of animals at a distance or in motion, as such knowledge often saves valuable time.

The falcons, including eagles, hawks, kites, buzzards and harriers, being such an interesting family of birds, I regret that, although they were numerous, I am unable to furnish much information concerning them; but I have no doubt that a resident naturalist in the country would have opportunities of observing their habits very closely, which would tend to clear up many doubtful points.

To commence with the eagles: the white-tailed sea eagle (*Falco albicilla*), I think, inhabits the Crimea during the year, is by no means

uncommon about the cliffs on the coast where it breeds, and I have noticed it fishing in the harbour of Sebastopol. An officer succeeded in taking a couple of young ones from the nest on the 12th of April, in the cliffs between Balaclava and the Monastery of St. George: he said that the nest was quite free from dung, owing to the peculiar mode of evacuation, which was observed when they were afterwards kept in confinement. Dr. William Carte has a specimen of this species.

The same officer who procured the young eagles agreed with me that two large eagles which we observed for a few days, always together, were the golden eagle, but, never having obtained a clear view, this bird is only included among the doubtful, and does not form one of the 129 species which we have made out for certain. I have on more than one occasion observed a smaller species, one of which I shot at, while quail-shooting one day, and, having wounded him, had a great hunt about the cliffs, but failed in capturing him.

There is one more species of which I must speak: the only specimen I know of having been killed was by a friend of mine in the far-famed Valley of Baidar, in May, who kindly brought me the specimen while fresh, which I accordingly skinned, not knowing the species, however, until my return to England, when, on walking through the British Museum, I espied one that was to my mind the same, and so it turned out to be, namely, the tawny eagle (*Aquila nævoides*). I preserved the sternum of this bird.

Let us now pass on to others of this family; and we find the hobby (*Falco subbuteo*) to be in appearance and habits a true falcon, though of no great size, being a peregrine in miniature: he stands, as it were, on the crest of the hill of falcons, as typical of the whole family, the slope on the one side being carried down by the eagles to the vultures, and on the other by the hawks, buzzards and harriers to the next family, owls, which, in like manner, rise to a culminating point, and fall again, uniting in another valley with the insect-feeders; and when we look at this gradual development of some characters with the falling off of others throughout the whole system of Nature, and at the filling up of gaps by the discovery of new species, we are led to ask, Who can define where one order, family or genus ends and another begins? and we find ourselves at a loss to ascertain that precise link in the chain where the dividing line should be drawn, and are ready to say that "species alone exist in Nature." Professor Rymer Jones has well illustrated this difficulty, in speaking of the animal and vegetable kingdoms. "Light and darkness are distinct from each other, and no one possessed of eye-sight would be in danger of confounding night

with day, yet he, who, looking on the evening sky, would attempt to point out precisely the line of separation between the departing day and approaching night, would have a difficult task to perform." The hobby is a most active and graceful bird on the wing, and often have I watched him chasing locusts and other winged insects, at the catching of which he is very expert, and, with a little attention, it is easy to see him take the prey from his claws with his bill. Whether this bird is a summer resident or merely a passing visitor about the time of the equinoxes I cannot say, but I should think it likely that some breed in the country, and that their numbers are augmented about the middle of September, for it did not attract my notice until that time, when it was numerous, and continued so until the end of the month, after which, on account of an attack of fever, I did not notice it until the 21st of November, at Scutari, on the Bosphoros, when I immediately recognised him by the peculiar evolutions while pursuing insects in the air. I have often seen seven or eight hawking together, but did not observe any during the spring, perhaps on account of their favourite food, the locusts, not being about at that season.

During the whole year I observed hawks of one kind or another, many of which were never made out: once I thought I saw a kite, and, early in May, I observed a large species, which appeared, seen from underneath, to be of a buff colour, with the ends of the wings and spot at the shoulder of each dark; and a day or two after a uniform dark coloured hawk.

I am, however, certain of the kestrel (*Falco tinnunculus*) and lesser kestrel (*Falco tinnunculoides*); the former of which I first observed, and shot a specimen on the 8th of August, when searching with my gun for an owl which I had seen near the camp. Not being aware at the time of the existence of the latter species, I must therefore say that I observed the one or the other, or both, from the 12th of April, numerous during the spring, particularly about the cliffs of Inkermann, where, I should say, they breed, and during a ride to the Alma at the end of May. Dr. William Carte brought home specimens of both species.

I shot a specimen of the sparrowhawk (*Falco nisus*) on the 4th of September, which I preserved, but I have no note of having observed it at any other time.

Specimens of the redfooted falcon (*Falco vespertinus*) and marsh harrier (*Falco æruginosus*) are to be seen in England, which have been brought from the Crimea, and I shot several of the hen harrier (*Falco cyaneus*) which was abundant in September; I again observed it towards

the end of February, and saw some fine adult males in March and until near the end of April. I cannot say whether this species is resident during the year.

The habits of birds whose movements are more or less restricted to the night are of course not easily observed, and therefore it is that, by the superstitious, all kinds of depredations are laid to their charge, and, for this reason, the species of the family we now come to have been called birds of ill omen. It was towards evening of a day at the end of September, having been skinning specimens all the afternoon, when I mounted my horse, and, having gone some distance past a French camp, it had grown dusk. I had just pulled up after a sharp gallop towards Cape Violente, and was approaching a part of the cliffs where the French used to throw their dead cattle into the sea, when an owl circled upwards, and was lost to sight.

At the edge of the cliffs there were a number of dead bullocks together, and when I approached within thirty yards a large bird hardly rose, and, flapping its wings, rested on the very edge of the cliff: my first and momentary thought was that I had disturbed a vulture who had taken up its position for the night on the scene of its last meal; but the form of the dark figure, standing in relief against the clear evening sky, at once undeceived me, and two large horns erect on his head denoted him a horned owl, and, from his size, likely to be the eagle owl (*Strix bubo*), which I believe he was, for I have since seen a specimen brought from the country. I know of one that was in confinement, and have heard of others being seen. During the continuation of my evening's ride along the cliffs I noticed many more owls and bats, and it had been dark some time before I reached the camp.

The short-eared owl (*Strix brachyotus*) and the long-eared owl (*Strix otus*) both inhabit the Crimea: I obtained the former in September and April, and the latter in March. Dr. William Carte also obtained both these, and considers that the former is resident during the entire year.

There was a diminutive species, not larger than a thrush, which was pretty generally distributed, being common about rocks, buildings and old trees, and many were observed in the trenches during the siege: I had several opportunities of observing it, and have hunted more than once after one in the dusk of the evening, but neither Dr. William Carte nor myself ever obtained a specimen, and thus far I cannot trace a single one that has arrived safely in England, although I have heard of some that were preserved. I observed one go into a small hole in

a tree near Tchorgoun, on the Tchernaya, in April, where I think it was breeding.

There is still another species, which I have not identified, of which I shot a specimen at the end of July; but, on account of the heat, which, about that time, was one day as high as 98° Fahrenheit in my single tent with a thorough draught, I was unable to skin it, and moreover could not make out the sex by dissection, on account of the damage done by the shot, but, from a detailed description made at the time, I think it likely to have been Tengmalm's owl (*Strix Tengmalmi*), but, without further proof, am obliged to number him among the doubtful.

It is most likely that there are many specimens now in the United Kingdom, which, if known, would help to swell this list, and therefore, as it is my intention to continue these notes on the remainder of the birds of the Crimea, I should feel thankful to any one who could furnish me with the existence of species for certain, and any information concerning them, for I hope, at the end, to insert a true classified list of the birds ascertained to exist in that country, and, likely enough, a short paper on a few birds observed in Bulgaria.

I may here mention that I have among my specimens from the Crimea those rare birds *Alauda leucoptera* and *Xema lambruschini*.

THOMAS BLAKISTON.

Woolwich, November 10, 1856.

Lists of Birds observed in the Crimea.

By L. H. IRBY, Esq., Lieut. 90th Light Infantry.

Griffon Vulture (*Vultur fulvus*). Very common in the winter of 1854-5, but was less numerous afterwards, probably in consequence of the burial of all animal matter. This bird nested in the rocks near Balaclava.

Egyptian Vulture (*V. percnopterus*). Very common during the winter of 1854-5; not often seen afterwards: was observed more in flocks than the griffon vulture.

Golden Eagle (*Falco chrysaëtos*). Only one specimen of this bird came to my knowledge, which was killed while feeding on a dead dromedary in December, 1854.

Whitetailed Eagle (*F. albicilla*). Seen in the winter of 1854-5, and also bred on the rocks near Balaclava.

Whiteheaded Eagle (*Falco leucoryphus*). Common in the

interior of the Crimea; not seen among the rocks by the coast. This bird bred, in two instances, on trees close to the Katcha river: the nests were about thirty feet from the ground, and were very large, formed of sticks, lined with grass and old rags. The remains of a hare was in one nest, in which was also a young bird, just hatched, which did not live long, as may be imagined. A very fine specimen was killed with a revolver, while sitting on a tree near the Alma: the bird was apparently gorged, and therefore allowed a very near approach. This eagle is apparently distinct from the American whiteheaded eagle (*F. leucocephala*), and is not, I think, described in any English work on Ornithology: unfortunately I was not aware of this at the time, and so did not particularly notice it: it is known to the Russian naturalists under the name of leucoryphon. A friend of mine, a good observer of birds, saw one of these eagles chase an osprey, and make it drop its fish: I have heard that the American whiteheaded eagle does the same. The head, feet and sternum of one of these birds are in England, and will no doubt clear up the question as to whether it is a distinct species or not.

Osprey (*Falco haliaëtus*). Two or three pairs frequented the harbour of Sebastopol in the spring of 1856.

Peregrine Falcon (*Falco peregrinus*). Seen on two or three occasions in winter.

Hobby (*F. subbuteo*). Migratory; first seen on the 24th of April; became common in June: appears to catch beetles, &c., on the wing, whereas the lesser kestrel generally catches them on the ground.

Redfooted Falcon (*F. rufipes*). Only two specimens, adult and immature male, came under my observation, which were killed on the 7th of June, 1856.

Merlin (*F. aesalon*). Observed in December, 1854, and in January, 1855.

Common Kestrel (*F. tinnunculus*). Common all the year, and often bred in the holes of trees.

Lesser Kestrel (*F. vespertinus*). Migratory; first seen in the beginning of April, and became very common afterwards: nested generally on rocks, sometimes on trees. On the 5th of May, 1856, I saw a lesser kestrel, a hoopoe, a bee-eater and roller go into holes in the banks of the Katcha, within a space of six or seven square yards. This little hawk appears to feed, when in a wild state, entirely on insects and beetles, generally taking them on the ground. A female, which was kept alive, would eat mice, and was also very fond of flies.

Goshawk (*F. palumbarius*). A single specimen was seen near the Bulganak in September, 1854: the observer, who told me of it, is himself a practical falconer, and therefore could not have mistaken it.

Sparrowhawk (*F. nisus*). Observed four times, in December, 1854, in December, 1855, and on the 1st and 16th of May, 1856.

Honey Buzzard (*F. apivorus*). One was killed on the 21st of May, 1856, and several seen in the same month.

Roughlegged Buzzard (*F. lagopus*). Seen in the vicinity of the Tchader Dag, about the 30th of April, 1856.

Common Buzzard (*F. buteo*). Once seen.

Common Kite (*F. milvus*). Once seen.

Marsh Harrier (*F. æruginosus*). Very common in spring about the marsh at Inkermann.

Hen Harrier (*F. cyaneus*). Very common throughout the year.

Ashcoloured Harrier (*F. cineraceus*). Common, and bred.

Long-eared Owl (*Strix otus*). Common in winter.

Short-eared Owl (*S. brachyotus*). One seen in December, 1855, nailed up over the door of a French canteen in "Little Kamiesch."

Scops Eared Owl (*S. scops*). Seen in May, 1856.

Barn Owl (*S. flammea*). Two were seen; one killed in the spring of 1856.

Tawny Owl (*S. aluco*). Seen two or three times.

Little Owl (*S. passerina*). Common throughout the year, frequenting holes in rocks and old stone quarries.

Redbacked Shrike (*Lanius collurio*). Migratory; first seen on the 1st of May, 1856; was afterwards more common than any bird, except the ortolan bunting.

Lesser Gray Shrike (*Lanius minor*). Migratory; first seen about the 1st of May, 1856, and was very common.

Spotted Flycatcher (*Muscicapa grisola*). Arrived in May, and was common in the vicinity of Yalta.

Golden Oriole (*Oriolus galbula*). Migratory; arrived in the middle of May, but was not numerous.

Missel Thrush (*Turdus viscivorus*). Very common throughout the year, particularly about Baidar and Varuntka.

Fieldfare (*T. pilaris*). Migratory; first seen on the 12th of November; last seen on the 28th of February, and was very common, though never seen on the high ground.

Redwing (*T. iliacus*). Migratory; arrived about the same time as the fieldfare, but was not so numerous.

Song Thrush (*T. musicus*). Seen occasionally in winter, and became common by the first week in April.

Blackbird (*T. merula*). Common throughout the year.

Hedgesparrow (*Accentor modularis*). Once noticed.

Robin (*Sylvia rubecula*). Noticed in December, 1855, and on the 18th of April, 1856.

Bluethroated Warbler (*S. suecica*). Only seen once, on the 18th of April, 1856, at Inkermann.

Redstart (*S. phænicurus*). Seen in April, 1856.

Black Redstart (*S. tithys*). One was obtained by the Surgeon of the "Europa" transport at Eupatoria, in December, 1854.

Pied Wheatear (*Saxicola leucomela*). Migratory; first seen in the middle of May, and was not uncommon among the rocks and quarries at Inkermann.

Wheatear (*Sylvia ænanthe*). Migratory; first seen on the 7th of April, 1856, and was common.

Stonechat (*S. rubicola*). Rare.

Whinchat (*S. rubetra*). Rare.

Sedge Warbler (*S. Phragmitis*). Migratory and common, arriving in May.

Nightingale (*S. lusciniæ*). Migratory; first noticed, when singing, on the 23rd of April, 1856: was more common near Yalta than about Sebastopol.

Whitethroat (*S. cinerea*). Migratory, arriving in spring, and common.

Lesser Whitethroat (*S. curruca*). Migratory, arriving in spring, but not common.

Blackcap (*S. atricapilla*). Migratory, arriving in spring, and seen occasionally.

Willow Wren (*S. trochilus*). Migratory; first seen on the 21st of May, 1856, but was not common.

White-eyed or Barred Warbler (*S. nisoria*). Twice noticed about the end of May, 1856; one which I shot was very difficult to get, skulking in a juniper bush, in the same way as a Dartford warbler does in furze.

Great Titmouse (*Parus major*). Common throughout the year.

Blue Titmouse (*P. cæruleus*). Common throughout the year.

Cole Titmouse (*P. ater*). Common throughout the year.

White Wagtail (*Motacilla alba*). Migratory, and common, arriving in the first week in April.

Yellow Wagtail (*M. Rayi*). Migratory, and very common, arriving in April.

Blackheaded Yellow Wagtail (*M. melanocephala*). Arrived in April; was rather scarce, and only found in marshy ground.

Grayheaded Yellow Wagtail (*M. neglecta*). Migratory, arriving in April, and was not uncommon.

Meadow Pipit (*Anthus pratensis*). Common throughout the year, except in very hard weather.

Tree Pipit (*A. arboreus*). Migratory; very common: first seen on the 23rd of April, 1856.

Sky Lark (*Alauda arvensis*). Common all the year; immense flocks were seen in winter.

Crested Lark (*A. cristata*). Migratory and common, arriving in May.

Shorttoed Lark (*A. brachyductyla*). Migratory, arriving early in May, and bred.

Calandra Lark (*A. calandra*). Common and indigenous, breeding on the steppes north of Sebastopol: was found in large flocks in winter, and was very good to eat.

Common Bunting (*Emberiza miliaria*). Migratory, arriving in April; seen once in December, 1855.

Blackheaded Bunting (*E. schœniclus*). Common, and seen throughout the year.

Yellowhammer (*E. citrinella*). Common throughout the year, but not seen except in the woody parts.

Ortolan Bunting (*E. hortulana*). Migratory and very common; first seen April 1st, 1856.

Meadow Bunting (*E. cia*). Seen in December, 1855. A spider was in the mouth of one that was shot.

Chaffinch (*Fringilla cœlebs*). Common all the year.

Brambling (*F. montifringilla*). Migratory, arriving about the end of October and departing in March. Seen in large flocks in winter, often in company with the siskin and goldfinch.

House Sparrow (*F. domestica*). Common all the year.

Goldfinch (*F. carduelis*). Common in winter, but the greater number appeared to go North in spring.

Siskin (*F. spinus*). Common in winter; apparently migrates. One was seen near the Katcha on the 5th of May, 1856.

Linnet (*F. cannabina*). Seen in winter.

Lesser Redpole (*F. linaria*).

Greenfinch (*F. chloris*). Seen occasionally during the year.

Hawfinch (*F. coccothraustes*). Once obtained in December, 1855, at Inkermann. This bird has also been seen at Heraclea, in Asia Minor.

Bullfinch (*Loxia pyrrhula*). Common in the woody part about Baidar, &c.

Starling (*Sturnus vulgaris*). Common and breeds; not observed till the middle of March. The Russians were in the habit of putting up small boxes placed on poles for these birds to nest in, and were very indignant if they saw any one shoot either the starling or the rosecoloured pastor, taking care to make it understood that starlings in general were unfit to eat.

Rosecoloured Pastor (*Pastor roseus*). Migratory; very common, and generally seen among cattle; first seen on the 10th of May.

Raven (*Corvus corax*). Common in the winter of 1854-5, but was not so common latterly.

Carrion Crow (*C. corone*). Seen occasionally.

Hooded Crow (*C. cornix*). Very common in winter; a few remained to breed. The nests which I saw were on trees, within a few feet of the ground.

Rook (*C. frugilegus*). There was a rookery near Sebastopol, on the road to Alouchta.

Jackdaw (*C. monedula*). Very common throughout the year, and bred in holes in the rocks at Inkermann, and in rocks along the "Water Ravine."

Magpie (*C. pica*). Common all the year, and bred. I once saw, with the aid of a telescope, three of these birds waiting by a white-tailed eagle, and, directly the eagle flew away, they pounced on the remains of what he had been feeding on: I went up to the place, and found the feathers and remains of a blackbird. It appeared to me very extraordinary that an eagle should catch a blackbird, and if he had caught it I should have thought he would have bolted it without leaving a feather.

Jay (*C. glandarius*). Found throughout the year in the woody parts about Baidar.

Spotted Woodpecker (*Picus major*). Common throughout the year wherever there were any quantity of trees.

Wren (*Troglodytes europæus*). Common throughout the year.

Hoopoe (*Upupa epops*). Migratory; first seen on the 9th of April: was very common, and bred. The young ones will live well in confinement if fed on soaked bread.

Cuckoo (*Cuculus canorus*). Migratory; first seen on the 24th of April, and was quite as common as in England.

Roller (*Coracias garrula*). Migratory; first seen on the 1st of May; was very common, and bred in holes in the north bank of the Katcha,

about a mile from the sea; they also nested in holes among the rocks at Inkermann.

Bee-eater (*Merops apiaster*). Migratory; first seen on the 5th of April, and was not uncommon, frequenting the same places on the Katcha as the roller.

Kingfisher (*Alcedo ispida*). Seen only once in winter, but was not uncommon in May.

Swallow (*Hirunda rustica*). Very common; breeding in rocks. Migratory; first seen on the 3rd of April, 1856.

Martin (*H. urbica*). Not so common as the swallow. Migratory; first seen on the 3rd of April, 1856.

Sand Martin (*H. riparia*). Migratory, and not uncommon; first seen on the 22nd of April, 1856.

Whitebellied Swift (*Cypselus alpinus*). Migratory; first seen on the 2nd of April, 1856: was very numerous, nesting in inaccessible holes and caves in the cliffs at Inkermann.

Swift (*C. apus*). Migratory; first seen on the 10th of April, 1856: was not so common as the whitebellied swift.

Nightjar (*Caprimulgus europæus*). Migratory, and often seen among the short brushwood and juniper bushes; first seen on the 1st of May, 1856.

Ring Dove (*Columba palumbus*). Seen in April and May, 1856.

Rock Dove (*C. livia*). Seen occasionally on the sea coast.

Turtle Dove (*C. turtur*). Migratory; first seen on the 25th of April, 1856, and was very common.

Pheasant (*Phasianus colchicus*). I am not aware that this bird is found in the Crimea, but it probably is, as they are found in small numbers at Samsoun, in Asia Minor, and also in the vicinity of Scutari.

Partridge (*Perdix cinerea*). Is found throughout the year on the steppes, but not in great numbers.

Redlegged Partridge (*P. rubra*). Seen occasionally during the year.

Quail (*Perdix coturnix*). A few are found in April; in September great quantities arrive on their passage.

Great Bustard (*Otis tarda*). A flight of these birds arrived about the 5th of January, 1856, the wind at the time being N.N.E.; great numbers were killed and seen near Balaclava and Kamara; they are also seen about the plains near the Alma in May.

Little Bustard (*O. tetrax*). Found on the plains near the Alma: several which I saw that were killed in May were in the summer plumage.

Thick-knee or Stone Curlew (*Ædicnemus crepitans*). One was killed on the 6th of May, 1856, in front of the camp of the 2nd Brigade, Light Division.

Golden Plover (*Charadrius pluvialis*). Seen in flocks in the first week in March, 1856.

Dotterell (*C. morinellus*). Seen in great numbers from the 26th of March to the 9th of April, 1856: on one occasion I killed fourteen couple in the day.

Ringed Plover (*C. hiaticula*). Seen on the coast near the Katcha on the 1st of May, 1856.

Little Ringed Plover (*C. minor*). Common in spring and summer, and seen inland as well as on the coast.

Lapwing (*Vanellus cristatus*). Common; not seen till March; seen near the Katcha in May, 1856.

Curlew (*Numenius arquata*). Seen occasionally in April, 1856.

Greenshank (*Totanus glottis*). Seen on the 30th of April, 1856.

Redshank (*T. calidris*). Seen in small numbers in the first week in April, 1856.

Green Sandpiper (*T. ochropus*). Common from the 1st to the 10th of April; seen also in May, and once in the first week of June.

Wood Sandpiper (*T. glareola*). A flight of wood sandpipers appeared about the 15th of April, 1856, but did not stay.

Common Sandpiper (*T. hypoleucos*). Seen only once, on the 6th of May, 1856.

Crane (*Grus cinerea*). Three seen in January, 1855.

Numidian Crane (*G. virgo*). One was killed by a Tartar with a stick, another was kept alive in the yard of an hotel at Yalta, in May, 1856. Some species of crane was seen flying in great flocks in spring, but they were too high up to enable any one to identify the species.

Great White Heron (*Ardea egretta*). Seen now and then. A Russian officer told me it was uncommon.

Heron (*A. cinerea*). Seen several times during the year.

Purple Heron (*A. purpurea*). This bird is the common heron of the Crimea, being seen more frequently than any other, but I could not find out where it bred, all birds were so harassed by "sporting" Frenchmen that they had no chance of resting.

Buffbacked Heron (*A. russata*). Seen two or three times in May, 1856.

Little Egret (*A. garzetta*). Obtained on the Alma on the 24th of April, 1856, and on the Tchernaya in May, 1856: both specimens were adult males.

Bittern (*A. stellaris*). Killed several times in winter: is very common at Sinope.

Little Bittern (*A. minuta*). Several were seen and obtained in the spring of 1856; the first on the 2nd, the last on the 22nd of May.

Night Heron (*Nycticorax ardeola*). Seen in April, May and June, 1856; is common in the vicinity of Scutari.

Black Stork (*Ciconia nigra*). Seen once, in the spring of 1856.

Woodcock (*Scolopax rusticola*). Common, arriving in October and departing in March.

Great Snipe (*S. major*). First seen on the 9th of April; was common at the end of May, and probably would have bred, had it been left undisturbed.

Common Snipe (*S. gallinago*). Common in winter and spring; last seen in May.

Jack Snipe (*S. gallinula*). Seen once in April, 1856.

Water Rail (*Rallus aquaticus*). Seen in December, 1855.

Land Rail (*Gallinula crex*). Migratory and very common; first seen on the 1st of May, 1856.

Spotted Crake (*G. porzana*). Seen in April, 1856.

Little Crake (*G. pusilla*). Common in April.

Baillon's Crake (*G. Baillonii*). Very common in April in the marsh at Inkermann.

Moorhen (*G. chloropus*). Seen occasionally.

Coot (*Fulica atra*). Observed occasionally in April and May.

Hooper (*Cygnus musicus*). Observed two or three times in winter.

Whitefronted Goose (*Anser albifrons*). Very common.

Ruddy Sheldrake (*Anas rutila*). Two seen on the 24th of April, 1856, on the Alma.

Shoveller (*A. clypeata*). Not seen in winter; first seen on the 23rd of April, 1856, and was not uncommon during May.

Gadwall (*A. strepera*). Not seen till the 1st of May, 1856, and was common in May and the first week in June.

Pintail Duck (*A. acuta*). Very common in winter; last seen in April.

Wild Duck (*A. boschas*). Very numerous in winter; a few remained in spring.

Garganey (*A. querquedula*). First seen in April; very common in May.

Teal (*A. crecca*). Seen in winter, but not later than April.

Wigeon (*A. Penelope*). Very common in winter; last seen in April, 1856.

Pochard (*A. ferina*). Very common in winter.

White-eyed Pochard (*A. nyroca*). Seen once in winter.

Goldeneye (*A. clangula*). Common during severe weather.

Tufted Duck (*A. fuligula*). Common in winter.

Common Scoter (*A. nigra*). Seen occasionally in winter.

Smew (*Mergus albellus*). Very common in winter.

Goosander (*M. merganser*). Seen in winter.

Redbreasted Merganser (*M. serrator*). Once seen exposed for sale in a French canteen, as "un canard," on the 8th of January, 1856.

Great Crested Grebe (*Podiceps cristatus*). One obtained on the 5th of January, 1856.

Eared Grebe (*P. auritus*). Seen in Kamiesch harbour on the 4th of November, 1855, and again exposed for sale in a French canteen in January, 1856.

Cormorant (*Carbo cormoranus*). Common throughout the year.

Shag (*C. cristatus*). Seen occasionally.

Great Northern Diver (*Colymbus glacialis*). Seen in Balaclava harbour in December, 1854.

Caspian Tern (*Sterna caspia*). Common, arriving about the 19th of April.

Common Tern (*S. hirundo*). Common, arriving early in May.

Arctic Tern (*S. arctica*). Seen two or three times in May.

Lesser Tern (*S. minuta*). Seen in May.

Herring Gull (*Larus argentatus*). Seen in the spring of 1856.

Great Blackbacked Gull (*L. marinus*). Seen several times.

Lesser Blackbacked Gull (*L. fuscus*). Seen on one or two occasions.

Common Gull (*L. canus*). Common all the year.

Kittiwake (*L. tridactylus*). Observed occasionally.

Guillemot (*Uria troile*). I am informed that this has been seen near Balaclava.

In conclusion, I may as well say that a skua gull and a pelican were seen, but as they were not shot it was impossible to identify them.

L. H. IRBY.

Aldershott, November, 1856.

Occurrence of the Great Gray Shrike near Leeds.—While out grouse shooting a few miles beyond Otley, Yorkshire, about a fortnight ago, my attention was attracted by a bird in a detached holly-tree, which appeared to me to be a stranger, and, upon nearer inspection, it proved to be a graybacked shrike, and as I wanted a specimen I

considered myself very fortunate when she fell to my shot (for it proved to be a very fine female specimen).—*John J. Wilson; Ronnahay, near Leeds, November 13, 1856.*

The Hooded Crow (Corvus cornix).—A specimen of this bird, in fine plumage, was shot by Mr. Matthews, gamekeeper on the Melbourne estate, near the High Wood, Melbourne, on the 9th of November last: there was a pair, but the second bird escaped: they had been drawn to the spot by the smell of a dead cat, over which they sat, on a tree, uttering their coarse, loud notes. This bird is rarely killed in Derbyshire.—*John Joseph Briggs; King's Newton, Derbyshire.*

The Black Redstart (Sylvia tithys).—On the 3rd of November last a man named Joseph Thompson, an under-keeper on the Melbourne estate, brought me a small bird which he had accidentally caught in a vermin-trap set in a dry ditch. Never having seen an example in the flesh of the black redstart, at first sight I mistook it for a female redstart; but recollecting that the redstart usually leaves us in August, and that this was caught on the 3rd of November, some eight or ten weeks after the redstarts' departure, I was induced to examine it more closely, and I have no doubt of its being a female of the black redstart. The plumage is darker than that of the female redstart, with which it has been compared, and it is distinguished from it by some small spots on the throat, and in appearance it precisely agrees with the coloured figure of the female black redstart figured in the Rev. F. O. Morris's 'British Birds:' these circumstances warrant me in concluding that it is a bird of this rare species, the first, I believe, ever taken in Derbyshire. Another bird, which, from the description I received, I have no doubt of being a male of this species, was seen a few days afterwards near the spot where the female was taken.—*Id.*

Great abundance of the Pied Wagtail (Motacilla Yarellii), &c.—Extracts from notebook:—"Ventnor, Isle of Wight, October 8, 1856. I this afternoon observed a number of these common, but most elegant birds, in a meadow near Steephill, following the cattle: they were by no means shy, allowing my approach within a few yards, and it was interesting to remark their manner of taking the flies, with which the animals were surrounded; so long as they continued quietly grazing the wagtails would run to and fro, darting after the flies in all directions, and even occasionally taking them from off the sides and legs of the cows, and one or two I saw settle, for an instant only, on their tails; but, when the cattle moved, they would all rise at once and follow them, each animal having a bevy of wagtails in attendance. Towards sunset, after gathering together in large flocks, I noticed them taking an easterly direction, which I have for some days perceived to be their usual course. Although not (in the common acceptation of the term) a migratory race, they are doubtless instinctively seeking out the most sheltered localities wherein to pass the cold and dreary winter months, and where the presence of cattle ensures them, if not a constant, at least a more plentiful supply of food than could possibly be met with in their more exposed summer haunts. It has been remarked by one of our most celebrated naturalists (Professor Macgillivray), that 'they very rarely perch on a tree or bush;' but I have frequently seen them, when disturbed, alight on willows and other aquatic trees, and even on the occasion referred to I observed one not only fly into a large plane-tree, but remain perched on one of the branches for a considerable time. October 11, 1856. Last willow wrens seen by me. October 12, 1856. Saw a perfectly white swallow."—*H. W. Hadfield; Tunbridge, November 4, 1856.*

House Sparrow.—Probably it may have been observed, but I am not aware that I have seen it remarked on,—the somewhat peculiar habit that the house sparrow has,

not only of resorting to and occupying its old nest, but of repairing and relining it for the winter, when the leafless trees no longer afford it a secure or snug place of roosting: I say somewhat peculiar, because I am aware that it is recorded of the wren, that it retires at night and in severe weather to its old nest. I find it inserted in my note-book, "Ventnor, October 13, 1854. Saw a house sparrow carrying feathers into its nest under the eaves." Again, "Tunbridge, November 1, 1856. Observed this morning a house sparrow carrying feathers into the ivy on the ruined castle in this town. In the afternoon saw another sparrow, with its bill crammed full of dry grass, fly on to the cottage and disappear among the creepers."—*Id.*

Migration of the Swallow Tribe.—In remarking on the migration of swallows (Zool. 4995), I quoted White of Selborne, as well as Cuvier, showing what their opinions were regarding the torpidity of swallows. Having just reperused Montagu's Introduction to his 'Ornithological Dictionary,' I there observe that he even seems to have been impressed with the same notions, although his remarks are somewhat more guarded:—"That an accidental summer bird of passage may be by disease prevented from returning to its natural winter quarters we can admit; because there are a variety of instances of the swallow and martin having been seen flying in the months of November and December, roused probably from a state of torpidity by an unusual warmth of the air."—p. xxvii. Having for many years been a pretty close observer of the swallow tribe, and having more than once had ocular proof of their presence during the winter months, long after the main body had taken its departure, the question naturally arises or suggests itself, what becomes of these stragglers? I do not presume to unravel this knotty point, or clear up the mystery; but, at the same time, I beg to suggest to all who may take an interest in the subject, whether it is not highly probable that none stay with us but the late broods, which are *compelled* to remain behind, subsisting for awhile as best they may, but soon to be driven by the increasing severity of the weather to seek shelter for a *time*, under the eaves of houses or in holes and chimneys; and doubtless the stronger among them instinctively endeavour to work their way to the southward, but leaving the more feeble to perish, as I never, that I am aware of, observed one later in the season than the month of December.—*Id.*; November 19, 1856.

Migration of the Swallow Tribe.—"October 23, 1856. Last swallow observed by me in this neighbourhood: it was flying about the church steeple, where I had previously noticed a few for some days."—*Id.*; December 2, 1856.

Nidification of the Hedge Sparrow.—Montagu seems to be of opinion that the hedge sparrow rears but one brood in the year:—"We have never been able to discover with certainty, either in the redbreast or hedgesparrow, who are the earliest breeders, the production of a second brood after the first has been brought to maturity. Their attention to their young continues long after they leave the nest."—p. xiii. But, on referring to my note-book, I find it recorded, "Ventnor, Isle of Wight, May 23, 1852. It is but a few days since the young hedgesparrows quitted their nest, but I observed the old birds very busy to-day collecting materials for a new one, which they are building in the same hedge, only a few yards distant from the old one."—*Id.*; November 19, 1856.

Occurrence of the Avocet (Recurvirostra avocetta) near Newark.—In the first week of last October, while fishing in the river Trent, near Newark, I saw three specimens of this beautiful bird on the wing: they were travelling up the course of the river, and as the nature of the ground partly concealed me from their view, I had a good

opportunity of observing them, as they passed at about twenty yards distance.—*H. Matthews; Plumtree, near Nottingham, November 20, 1856.*

Double Egg of Young Goose.—I have lately received a double egg, which was the first of any description laid by a young goose last spring. The outer shell measures $4\frac{1}{10}$ inches in length, and $2\frac{6}{10}$ inches in its greatest diameter; the inner shell is much less than the average of eggs laid by geese. Each shell contained a perfect yolk as well as white, which is, I believe, not usual. Are all the double eggs which occur laid by young birds?—*J. F. Brockholes; 7, Egerton Terrace, Birkenhead.*

Beautiful Variety of the Common Woodcock.—A most exquisite variety of the woodcock was killed, about the 6th of this month, at Hanworth, near Aylsham, in this county. Like the specimen described by Mr. Newman (Zool. 4631), all the markings peculiar to the woodcock in its usual plumage are in this bird more or less faintly indicated by the most delicate buff or fawn tint on a ground of white, whilst those parts which, in the normal colouring of this species, are deepest, are here also most plainly discernible. The whole of the under parts are white, yet still showing the usual bars when closely examined, resembling the faintest water-markings, visible only in the strongest light.—*H. Stevenson; Norwich, November 15, 1856.*

The Teal (Anas crecca) breeding in Cheshire.—On the 15th of May last I received from a country boy nine slightly sitted eggs of the teal, which had been found a day or two previously near Leasowe. The account he gave of the nest agrees pretty closely with that of Bewick: it was composed of a great quantity of materials, and lined with feathers: the site chosen for it was a hole amongst rough herbage on the margin of a large moss-ditch, provincially termed "sender." On the 26th the same boy had five more quite fresh eggs, which were found in a neighbouring field. In this instance the nest was composed of few materials, without any lining of feathers. On the 4th of June four more quite fresh eggs were found in the same neighbourhood, and under similar circumstances with the last. As the three nests, which were within a mile from the shore, were so close together, and the second and third so badly constructed, it is probable that they belonged to the same birds, especially as one pair only were seen. I saw the parent pair of teals in the neighbourhood of the nests at the time, and it is probable that they eventually succeeded in rearing a brood of young, since several have been seen in company this autumn close to where the nests were found, and still continue to frequent the place.—*J. F. Brockholes; 7, Egerton Terrace, Birkenhead.*

The Little Auk (Uria alle).—A beautiful specimen of this species was taken about the beginning of last November by William Hunter, Esq., near Kilborne, Derbyshire: it was found on a small pool near the Windmill, and hunted down by a dog, to which it afforded a considerable chase, by diving and endeavouring to elude pursuit; it was, however, taken alive, and put into confinement, but it died the next day. The spot where it was taken cannot be less than 120 miles from the sea, which is probably one of the longest distances it has been driven from the coast. I am not aware of another individual having been taken in Derbyshire: it is in the possession of Mr. Hunter, of Kilborne Hall.—*John Joseph Briggs; King's Newton, Derbyshire.*

Explanation of supposed Phenomenon.—A few days ago, as I was reading Jesse's 'Country Life,' I met with the following passage, and, as I have myself known a case of the same kind, in which the apparent want of veracity in the narrator is satisfactorily explained, I thought you might consider it worthy of insertion. Jesse says, "When I was at a visit at the house on the beautiful island in the Windermere Lake, I was informed that a person in the neighbourhood of Grassmere Lake has seen swallows

emerging from it." The man "bore a good character for honesty and credibility, and was as intelligent as most persons in his sphere of life, being a working carpenter." Some fourteen years ago, when residing at Great Glemham, in the county of Suffolk, I was told that our servant boy had seen a swallow fly out of the pond: as it was very early in the spring, and the weather cold and inclement, I felt little doubt that the bird he saw was not a swallow, and still less that it had not emerged from the water. Some days afterwards the man servant asked me to look at a bird which had been found near the pond before mentioned, which he said was like a swallow with web feet: directly I saw it I knew it was a stormy petrel, "Mother Cary's chicken" of the sailors, but I did not examine it sufficiently to be able to tell the species. The bird had doubtless been driven inland by stress of weather, had alighted in our pond as an eligible resting-place, and on rising from it had been mistaken for a swallow. Whether it is likely that the accounts of the emergence of swallows from the water, in the spring, have arisen from like causes, I am not prepared to say; but I mention this incident, for which I can vouch, as tending to throw some light upon a subject which appears to have attracted considerable interest.—*E. N. Bloomfield; Clare College, October 31, 1856. [Obligingly communicated by Professor Henslow.]*

The Short Sun Fish (*Orthogoriscus Mola*) and its parasite *Cecrops Latreillii* at the Channel Isles.—An example of the short sun fish was taken during the past summer between Jersey and Guernsey. I did not see the specimen, but two of its parasites (there were four taken) were brought to me for identification while staying in Guernsey. The parasites were *Cecrops Latreillii*, and were adhering, as they are usually found, to the gills.—*Alfred Merle Norman; Kibworth, Leicestershire, October, 1856.*

The White Shark (*Carcharias vulgaris*) cast up at Herm.—My friend Mr. C. F. Lukis, the well-known naturalist of the Channel Isles, while staying for a few days on the Islet of Herm in August, fell in with a white shark "twelve or fourteen feet long," among the rocks near the famed shell beach. I am not aware of any well-authenticated instances of the occurrence of this shark upon our coasts, and it is admitted with some doubt into Yarrell's work.—*Id.*

The Angel Fish (*Squatina angelus*) in the Firth of Clyde.—Our late lamented ichthyologist says that this fish is frequently taken on the east coast of England, and has been several times taken in Ireland, but no instance is given of its having been met with in the West of England or Scotland, neither does it occur in the 'Catalogue of the Fish of the Moray Firth,' by Mr. Gordon, though Dr. Baikie (Zool. 3845) says "rare" for the Orkney at Shetland Isles. It is by no means uncommon, however, in the Firth of Clyde, where it may be frequently found thrown up after gales. On one occasion we harpooned a fine fellow who was basking asleep in the sun, but it broke away before it could be secured.—*Id.*

The Anglesey Morris (*Leptocephalus Morrisii*) at Falmouth.—I have dredged a specimen of this remarkable riband-like fish in fifteen fathoms off Falmouth.—*Id.*

On the Maintenance of Molluscan Life in a very limited supply of Water, subjected to the exclusion of all Atmospheric influence.
By the REV. ALFRED MERLE NORMAN, B.A.

IT is now six years since Mr. Warington first announced his success in adjusting the relation between animals and vegetables in a limited quantity of water, so that health was preserved to all the inmates of the small glass tank which was employed. Since that time we all know the general use into which they have come, and the deserved admiration in which they have been held, enabling us, as they do, to have even in our drawing-rooms the most beautiful examples of marine and fluviatile life: add to this, most of us know the valuable discoveries that have been made and are making by their use, and the many interesting facts relating to the habits and economy of Fish, Mollusca, Crustacea, Radiata, &c., which have been brought to light. A host of inquirers have thus sprung up, and, led on by Messrs. Warington, Gosse, &c., are each contributing their iotas to the cause of Science.

Accident, I may say, has revealed to me a fact during the past year, which is highly interesting from the connexion it may have with this subject. Hitherto the inmates of our aquaria, as far as I am aware, have been confined to those species which are to be met with in this country; but the fact that I have discovered would almost lead one to hope that we might, without difficulty, transport the beautiful shells of Africa or the Pacific, and have the marine life of all climes fully represented in the Zoological Gardens. Such an idea is, I confess, building a mountain on a mole-hill—but to the facts.

One day in the first week in October, last year, I started for a conchological walk from Oxford towards Woodeaton, having my water-net and bottles in my pocket. At the foot of the hill on which Woodeaton stands there runs a beautiful little stream of the purest and most limpid water, and, having fished in this, I turned the contents of my net into a small bottle filled with water from the brook, tightly corked and pocketed it, and then walked home. The next day I left Oxford, and, as I had no time to remove the animals from the shells, the bottle was packed as it was, in a hat-box with all sorts of other things.

I will now mention what the contents of this bottle were, not indeed that I knew at the time of packing my hat-box, but as it will be more convenient for the reader to know, I will let him into the secret, though

I did not know the whole of it myself for more than a year afterwards. My friends in the bottle, then, were as follows:—

Animal.

- 1 *Bithonia tentaculata*, junior, $\frac{1}{10}$ th of an inch long.
- 31 *Valvata piscinalis*, six being full-grown, the rest small.
- 8 „ *cristata*; two full-grown, the remaining six young.
- 18 *Limneus stagnalis*, *Frey*; the largest not exceeding $\frac{1}{8}$ th of an inch long: it was for the sake of these that I had saved the contents of my net.

Vegetable.

Two small pieces of leaf, I *think*, *Myosotis*; the largest could scarcely have exceeded $\frac{1}{8}$ th of an inch square; the one was green, the other half decayed.

Two small seeds.

The bottle which contained these was a short wide-mouthed two-ounce one, and it was about two-thirds filled with water from the brook. The cork was of close texture, had a box-wood cap to it, and fitted the bottle very tightly.

The bottle remained where it had been packed, entirely forgotten, for some six weeks, until, going one morning to get some shells from the hat-box, I found it. To my great surprise, instead of the water being foul and stinking and all the animals dead, the water was as clear as when put in, and several *Valvatæ* were clinging to the sides of the bottle. On looking more closely I found that the *Limnei* were all dead, but that all the *Valvatæ* and the *Bithinia tentaculata* were alive. Another point that struck me as remarkable was that the one little piece of leaf was as green as ever, and had not been at all eaten, and the other was not at all more decomposed than when placed in the bottle. I immediately determined to leave the bottle as it was, in order to make further observations, and see how long these Mollusca would remain alive in the (say at the outside) ounce and a half of water, shut up, too, in an air-tight bottle. The following are the observations that have since been made:—

Middle of March. The two seeds, of whose presence I was now for the first time made aware, germinated, and in a few days had shot up long slender sickly stems to the surface of the water, and their cotyledons expanded, but remained of a sickly yellow. The half-decom-

posed morsel of leaf has disappeared; the green piece still remains in the same condition as before.

April 22. The cotyledons remain in the same condition, they have not put forth any true leaves.

June 2. One of the seed-plants and also the little piece of green leaf have disappeared; the cotyledons of the other seed-plant are rotting away.

June 8. The remaining plant has vanished. The Mollusca have been dying one by one during the months that have passed; by agitating the bottle, &c., I can procure signs of life from only three, namely, one *Valvata piscinalis* and two *Valvata cristata*.

August 6. Have been absent during the past month. It appears that only one *Valvata cristata* remains alive.

October 8. Up to this time, just a year and a day or two since I filled my bottle at the Woodeaton brook, the *Valvata cristata* has certainly been alive; as it is now, however, dead, I have opened the bottle, and turned the water out into a saucer, in order to examine and count over the shells. To my astonishment but delight the young *Bithinia tentaculata*, which has given no sign of life for many months past, is nevertheless still alive; all the rest are dead. Having removed the empty shells, I have replaced the water with the *Bithinia* in the bottle and recorked it.

November 15. The *Bithinia tentaculata* is still alive. I have removed the cork in order to *taste* the water, which is as *clear as crystal*; it is *perfectly pure and good*—I should consider myself very lucky had I never to drink worse!

We have here some very remarkable facts for our consideration; but, before saying anything on them, it may be well to mention certain conditions which I am of opinion were absolutely essential to the attainment of the results arrived at.

1st. The water was of the purest kind, taken from a swift-running bubbling stream, so that it was thoroughly aerated when placed in the bottle.

2nd. The bottle has been always kept in a *dark place*, a cupboard in a wall, where the temperature is very equable: had it been placed in a warm place, or where it was under the stimulus of sunlight, there cannot be the slightest doubt but that the chemical changes would have taken place that would have at once destroyed life.

3rd. I would wish notice to be taken that the Mollusca were captured at a season of the year when it is probable the vital functions were not in great activity: had they been incarcerated at a time when

these had been in full play, when the animal required considerable nourishment to supply the rapid absorption consequent upon growth of body and the secretion of the shell, the supply of nutriment must utterly have failed to meet the demand, and the mollusks must have perished. In the month of October, however, Mollusca, for the most part, have completed their growth for the year. The functions and secretory powers having been heavily taxed, as Mr. Lowe has recently shown, during a short period are comparatively dormant, and all the vital functions are gradually entering upon that sluggish and semi-torpid state in which the winter is passed. I am of opinion, therefore, that the vital powers of the Mollusca being in a state of comparative inactivity at the time they were inclosed, rendered them able to bear up against the severe trials to which they were subjected; that these circumstances being unaltered as the seasons came round, the animals remained in their comparative torpor, since the functions were not called into activity by any sensible rise in the temperature, or by the stimulating influence of the sunlight. The facts that none of the Mollusca increased in size during their incarceration, and that they always appeared to be in a very lethargic state, seem to add weight to this supposition.

There remain a few observations to be made upon the *results*.

The *first* point that may strike the reader is that the Mollusca lived during such a lengthened period without food. They had not *much*, certainly, to be divided among forty mouths, which remained to be filled after the death of the eighteen Limnei; still they had *some*—the two little scraps of leaf and the two cotyledons. I think it, moreover, highly probable that they fed upon the bodies of their deceased friends, for, although naturally vegetable feeders, many inland Mollusca have been known to become animal feeders: I have myself seen *Arion empiricorum*, *Limax maximus* and *agrestis*, and *Helix aspersa* devour decomposed animal matter. Granted, however, that they ate everything that was in the bottle, animal as well as vegetable, they must have been even then on extremely “short commons.” The fact, however, that inland Mollusca can live for very lengthened periods of time without food is already known. Mr. Woodward, in his excellent ‘Manual of Mollusca’ (published as one of Weale’s Rudimentary Treatises), at pp. 18, 19 gives many instances; I will extract the last:—“The most interesting example of resuscitation occurred to a specimen of the desert snail (*Helix desertorum*) from Egypt, chronicled by Dr. Baird (Ann. Nat. Hist. 1850). This individual was fixed to a tablet in the British Museum, on the 25th of March, 1846;

and on March 7th, 1850, it was observed that he must have come out of his shell in the interval (as the paper had been discoloured, apparently in his attempt to get away); but, finding escape impossible, had again retired, closing his aperture with the usual glistening film; this led to his immersion in tepid water, and marvellous recovery." To the instance mentioned by Mr. Woodward I may add two from my own observation. In August, 1852, I collected some specimens of *Helix sylvatica* at Sion, in the valley of the Rhone; on removing them from the chip box in which they had been placed, a year and a half afterwards, the majority of them were found to be still alive. While now writing I have a *Helix aspersa* near me which certainly has not tasted food since March, and as it was captured the first spring day that I had seen one of his race abroad, it seems highly probable that he has not had more than a single meal (if he had had time to get that) for nearly a year, since *H. aspersa* usually retires to hybridate about this time, at any rate in this cold part of the country. I therefore do *not* consider the abstinence from food of the Mollusca in the bottle to be anything novel.

The *second* point to be noticed is, however, of great importance,—*the fact that these animals lived during such a lengthened period without any oxygen being supplied to them.* It is not a little remarkable that the pulmonated *Limneus stagnalis*, which breathe the air by means of *lungs*, were unable to find a sufficient amount of oxygen in the air confined between the water and the cork (about one-third of the volume of the bottle) to support life, and *at once* died, whereas the *Valvatæ* and *Bithinia*, though more than double the *Limnei* in number, were able, by *means of their branchiæ*, to extract a sufficient quantity of oxygen from the water for respiration during a considerable period of time, and that some of them lived for a whole year. I do not see how any additional supply of oxygen could have been imparted to the water after it had been placed in the bottle; the small piece of leaf, a mere atom, even if growing under favourable circumstances, could have aerated the water to but a very trifling amount; but as it was not attached to this plant, and moreover was deprived of the stimulus of light, I imagine that it could not have contributed in the slightest degree to the oxygenating of the water: the two cotyledons, never having put forth leaves, could not have had any influence either. On the other hand, we see many causes that we should have expected would have rendered the water unfit for the maintenance of life, and many sources whence it might naturally have been thought that carbon would have been abundantly generated; the decomposing

animal and vegetable tissues would give off a considerable quantity of carbonic acid, and the two seeds in the process of germination must also have liberated carbon. The supposition, however, that the Mollusca which remained alive became cannibals and devoured the remains of their friends will, in a great measure, do away with the difficulty as regards the most abundant source of deleterious gas. Lest it should be supposed that any oxygen could have been derived from the air, I again repeat that the cork was quite air-tight, and this is best proved by the circumstance that since the water was placed in the bottle not the smallest quantity has been lost by evaporation, and, as a proof that such is the case, and as evidence, moreover, of the purity of the water, it may be mentioned that there is not the slightest stain upon the glass at the height the water stands,—not the least sign of high-water mark (so to speak) upon the sides of the bottle, and if it was emptied it would be impossible to find the faintest trace which would mark the height at which the water had stood.

I shall hope to make further experiments on the subject of this communication, to see if the same results can be again attained. Perhaps some one by the sea will see what can be done with salt water. I would recommend any person trying the experiment to procure the water a mile or two from land, to ensure its purity, and that the Mollusca should be of some *species which inhabit the Laminarian zone*, say *Trochus striatus*, *Montagui* or *tumidus*, or some of the *Rissoæ*; the other necessary conditions to ensure any chance of success being that the animals be taken in the autumn or winter, when the vital energy is at a low ebb,—that the bottle be tightly corked or fastened down, so as to prevent all communication with the external air,—that it be kept in a place where the temperature is cool and equable, and that it be effectually secured from all light.

ALFRED MERLE NORMAN.

Kibworth, Leicestershire,
November 17, 1856.

*The Classification of the Deltoïdes and Pyralites of M. Guenée, with
Remarks.* By C. R. BREE, Esq.

IN the eighth volume of his great work, the 'Histoire Naturelle des Insectes Lépidoptères,' M. Guenée has given us a reconstruction of the Linnean group *Pyralis*. Taking from it the small genus *Nola* of

Leach, he has added to it the genus *Scoparia* of Haworth, better known to modern entomologists as the genus *Eudorea* of Curtis and Stephens. The group thus formed he has divided into two divisions, constituting the seventh and eighth divisions of his great class *Heterocera*, or nocturnal *Lepidoptera*; and these divisions he has named respectively *Deltoïdes*, after Latreille, and *Pyalites*. The *Deltoïdes* he subdivides into three families, the *Platydidæ*, *Guen.*, *Hypenidæ*, *H.-S.*, and the *Herminidæ* of Duponchel. Of these families the two last only are represented in Great Britain. The *Pyalites* he divides into four tribes: 1, the *Squamosæ*, comprising a single family, the *Adontidæ*; 2, the *Pulverulentæ*, comprising two families, the *Pyalidæ* and *Cledeobidæ*; 3, the *Luridæ*, consisting of eight families, five of which are represented in Great Britain; and 4, the *Plicatæ*, consisting, like the first tribe, of a single family, the *Scoparidæ*, into which he has absorbed the genus *Eudorea* of Curtis.

The *Deltoïdes*, so called by reason of the triangular figure of the insect when in repose, form the transition between the *Noctuidæ* and the true *Pyrales*. They approach the former very closely: "Les premières *Deltoïdes* ont une extreme affinité avec les dernières *Noctuelles*, et la ligne de démarcation est très delicate."—Tom. viii. p. 2. Herrich-Schæffer has, in fact, united them to the *Noctuidæ*. The division appears to have been in great trouble, and had great difficulty, even from ancient times, in finding a resting-place. Fabricius united them with the *Crambi*. The *Theresiens*, we are told, separated them from the *Pyrales*, under the name of "*Pyrales with long palpi*," in which they were followed by Treitschke, Hübner, Stephens and Duponchel; while the founder of the group, Latreille himself, joined two other genera with them.

As restricted by Guenée, the *Deltoïdes* form a very natural group, which "conduira des veritables *Noctuelles* aux *Pyrales* proprement dites."

M. Guenée enters into a history of the classification of the second (eighth) division, the *Pyalites*, from the days of Linneus. Scopoli, Schrank, Hübner, Latreille, Lamarck and Haworth had each a separate arrangement of this group. Treitschke, it appears, was the first to commence a definite classification of the *Pyrales*; Stephens seems to have confounded them with the *Deltoïdes*; Duponchel follows Treitschke, but characterizes the group with more exactness, and details the genera with more order and form; and, lastly, Herrich-Schæffer, to whom M. Guenée pays a high compliment, while he severely criticises his arrangement, divides the *Pyrales* among the

twenty-four sections into which he splits the second tribe of his Noctuelles.

It must be admitted on all sides that M. Guenée displays a most profound knowledge of the subject he has undertaken. The '*Histoire des Insectes Lépidoptères*,' will doubtless become the standard work of modern days; and if it brings to bear upon the subject a higher amount of practical knowledge than any other it must be the basis of that great desideratum, a universal nomenclature of the Lepidoptera. Of the work, the first volume, comprising the butterflies, is by M. Boisduval and Guenée; the second, third and fourth are not published; the fifth, sixth, seventh and eighth, by M. Guenée, comprise his eight divisions of the Heterocera; and the Geometridæ is shortly to be published. Below I give from M. Guenée an arrangement of the British species of Deltoïdes and Pyralites. It is fortunate that most of the generic types occur in this country. I propose, if acceptable to British entomologists, that the arrangement of Boisduval and Guenée be used for naming their collections of Lepidoptera. If any one can make a better proposition I will adopt it, for one. It is, however, quite time that this subject were set at rest, that all our energies may be free for the study of other departments of our favourite science.

HETEROCERA.

Div. 7. DELTOIDES, Lat.

General Characters.—LARVÆ with deep indentations, the segments often knotted and hairy, but never velvety or completely glabrous, with six feet scaly and the two anal feet constant; the ventrals never vary more than from six to eight. The larvæ are never closed in cases or between the two membranes of leaves. They live solitary upon trees or low plants.

CHRYSLIDES unarmed, smooth; abdominal rings free, conical, and terminating in hooks or spines. They are contained in cocoons spun between leaves or in the ground.

IMAGO. *Antennæ* slender, cylindrical, always pubescent, ciliated or pectinated in the male, and garnished with isolated hairs in the female; often dilated or marked above the middle with squamose or velvety nodosities. *Labial palpi* only visible, compressed, never recumbent, always protruding beyond the head, either stretching forward or else surrounding it to rise above it, or even to be thrown upon the thorax; the second joint always long, the third always distinct

and agreeing in character with the second, with which it is often elbowed. *Spiral tongue* always well developed, though slight and short. *Body* usually thin, always glossy. *Thorax* short, rounded, slightly convex, covered with scales or a few hairs slightly adherent; the neck never elevated. *Pterygoids* slight, never ornamented with raised hairs. *Abdomen* long, slightly consistent, slightly velvety, not having, in the female, either projecting oviduct or anal tuft passing beyond its length. *Legs* long, not velvety; *tibiæ* shorter than femur, often dilated, and furnished with hair disposed in brushes or tufts; the *middle legs* furnished with one pair and the posterior with two pairs of spurs, always long and robust, particularly the inner ones. *Wings* proportionally large and thin, slightly squamose, rarely dentate, never raised in repose or folded round the body; *superior wings* never covering each other or entirely hiding the inferior ones, often marked with the same lines or spots as the Noctuæ; *inferior wings* well developed, slightly or not at all folded, having rarely colours or marks distinct from the upper ones.

NERVULATION. In the *upper wings* the subcostal furnishes from five to six nervules; areola generally existing, always unique, placed above the cell, of which it is independent, and always grouping around it; all the superior nervules inequally disposed, the median quadrifid and the submedian simple. *Lower wings*: the costal always joined to the subcostal just after its origin, the last only bifid and the median quadrifid; only two nervures free, the internal and the submedian.

Fam. 1. HYPENIDÆ, H.-S.

Gen. 1. *Madopa*, St., Dup., Gn., H.-S.
Colobochyla, St., Ill., & Cat. B. M.

Hypena, Tr.

Crambus, Haw.

1. *Salicalis*, W. V. (Type).

Gen. 2. *Hypena*, Schr.
Crambus, Haw.

Hyblæa, Fab.

1. *Proboscidalis*, Lin. (Type).

2. *Rostralis*, Lin.

Vittatus, Haw. Var.

Palpalis, Fab. Var.

3. *Crassalis*, Fab.

Teniculturalis, Hüb. Var.

Achatalis, Hüb. Var.

Gen. 3. *Hypenodes*, Gurn., H. D.
Cledeobia, St., H.-S.

1. Albistrigalis, *Haw.* (Type).
 Nolalis, *Guen.*
 Tænialis, *Hüb.*
2. Costæstrigalis, *St.*
 Leucopteralis, *Guen.*
 Acuminalis, *H.-S.*

Gen. 4. *Schrankia*, *H.-S.**Hypenodes*, *H. D.*, *St.*

1. *Turfosalis*, *Wocke.* (Type).
 Humidalis, *H. D.*, *St.*

Fam. 2. HERMINIDÆ, *Dup.*Gen. 1. *Rivula*, *Guen.*

1. *Sericealis*, *W. V.* (Type).
 Leeana (*Tortrix*), *Fab.*

Gen. 2. *Herminia*, *Lat.**Polypogon*, *Schr.*, *H. D. Cat.*

1. *Derivalis*, *Hüb.*
 Glaucinalis, *W. V.*
 Emortualis, *Haw.*, *St.*, *Wood.* 768.
2. *Barbalis*, *Lin.*
 Strigilata (*Geom.*), *Clerck.*
 Pectitalis, *Hüb.*
3. *Tarsipennalis*, *Tr.*
 Tarsicrinalis, *Hüb.*, *H. D.*, *Cat.*, *Wood.* 767.
4. *Grisealis*, *W. V.*
 Nemoralis, *Fab.*, *Wood.* 766.
5. *Cribralis*, *Hüb.*, *Wood.* 763.

Div. 8. PYRALITES, *Guen.*

General Characters.—LARVÆ thick, rarely elongated, with dilated and moniliform rings much attenuated at the two extremities, glossy and shining; segments verrucose and pilose; sixteen perfect feet; ventrals thin; head small and shining, frontal plate horny, that of the nape always distinct. They live always enclosed, some in animal substances, others in moss, others in water, the greater number between the leaves of vegetables, which they tie together with silk.

CHRYSLIDES unarmed, smooth, with a fine skin; abdominal rings free; form conical. Contained in cocoons spun where the larvæ have lived.

IMAGO. *Antennæ* generally long, thin and slender, filiform or moniliform, garnished with very fine hairs, rarely ciliated. *Labial palpi* sometimes disposed in a beak, sometimes normal, but of ordinary length, or when extended in a beak not having the third joint

elbowed or thrown back on the thorax, always alike in both sexes; *maxillary palpi* frequently distinct. *Body* thin. *Thorax* short and globular, more squamose than velvety. *Abdomen* long, squamose, glossy and shining, nearly always conical and short in the male, never garnished with a tuft in the female, in which it always terminates in a point more or less abrupt. *Thorax* often garnished with a squamose or velvety plate. *Legs* thin, long, glossy, very rarely velvety, anterior having the *thigh* and *haunch* long, nearly equal; *tibiæ* more than half shorter; *tarsi* very long; the two other pair of legs very long and silky, and extended beyond the abdomen. *Wings* shining, often iridescent or half-transparent, entire, never raised in repose or folded round the body; *superior wings* always longer than the inferior, marked with lines, of which the two median are constant, but the subterminal almost always non-existent or scarcely indicated; *inferior wings* imperfectly developed, sharing often the marks and colours of the superior.

NERVULATION. In the *upper wings* no areola; the subcostal has six complete nervules, the 1', 2' and 1'' always free, median quadrifid. In the *superior wings* the costal is robust, nearly always bifid, and giving birth to 2' and 3'; the subcostal stretching only to the discocellular, which it crosses in the form of the letter X, then reduced to a very thin thread, very often atrophied before the base of the wing and sometimes quite extinct; median constantly quadrifid; three free nervures after it, submedian, intermedian, and the internal.

Tribe I. *Squamosæ*, Guen.

Fam. unique. ODONTIDÆ.

Gen. 1. *Odontia*, Dup.

1. *Dentalis*, W. V. (Type).
Fulminans (Noct.), *Fab.*
Radiata (Noct.), *Erp.*
Ramalis (Pyr.), *Fab.*, non *Hüb.*

Tribe II. *Pulverulentæ*, Guen.

Fam. 1. PYRALIDÆ, Guen.

Gen. 1. *Pyrallis*, Lin.

1. *Fimbrialis*, W. V.
Costalis, *Fab.*, *Wood*, 781:
2. *Farinalis*, Lin. (Type).
Lienigialis, H.-S. Var.
3. *Glaucinalis*, Lin.
Nitidalis, *Fab.*, *Hüb.*

Gen. 2. *Aglossa*, *Lat.*

1. *Pinguinalis*, *Lin.* (Type).
Streptfeildii, (*Curt.* 455, *Wood*, 777. Var.)
2. *Cuprealis*, *Hüb.*
Capreolatus, *Haw.*

Fam. 2. *CLEDEOBIDÆ*, *Dup.*Gen. 1. *Cledeobia*, *St.*

1. *Angustalis*, *W. V.* (Type).
Erigalis, *Fab.*
Bombycatus, *Haw.*
Curtalis, *W. V.*

Tribe III. *Luridæ*.Fam. 1. *ENNYCHIDÆ*.Gen. 1. *Pyrausta*, *Schr.*

Botys, *H.-S.*

1. *Punicealis*, *W. V.* (Type).
Porphyralis, *Hüb.*, *Wood*, 796.
2. *Purpuralis*, *Lin.*
Punicealis, *Hüb.*
3. *Ostrinalis*, *Hüb.*
Punicealis, *Haw.*, *Wood*, 794.
Purpuralis, *Hüb.* 35?

Gen. 2. *Rhodaria*, *Guen.*

1. *Sanguinalis*, *Lin.* (Type).
Cruentalis, *Scriba.*

Gen. 3. *Herbula*, *Guen.*

1. *Cespitalis*, *W. V.* (Type).
Zonana, *Schæff. ic.* pl. 262 (♀).
Vestianella, *Clerck*, non *Lin.*
Sordidalis, *Hüb.*, *Wood*, 792.

Gen. 4. *Ennychia*, *Tr.*

Botys, *H.-S.*

1. *Cingulalis*, *Lin.* (Type).
Fascialis, *Dup.*
Anguinalis, *Haw.*
2. *Anguinalis*, *Geoff.*
Fascialis, *Schrank.*
3. *Octomaculalis*, *Lin.*
Guttalis, *W. V.*
Atralis, *Fab.*
Trigutta (Noct.), *Esp.*

Fam. 2. *ASOPIDÆ*, *Guen.*Gen. 1. *Agrotera*, *Schr.*

Asopia, *Tr.*, *Dup.*

1. *Nemoralis*, Scop.

Erosalis, Fab. (A single specimen taken by Mr. Hemmings, June 26, 1851, near Enfield). — *Ent. An.* 1855, p. 23.

Gen. 2. *Endotricha*, Zell.

Agrotera, St.

Asopia, Tr. (*H. D. Cat.*)

1. *Flammealis*, W. V.

Meritalis, Fab.

Fam. 3. STENIADÆ.

Gen. 1. *Diasemia*, St.

Prodelia, Guen. olim, *H. D. Cat.*

Hydrocampa, Dup.

Nymphula, Tr.

Botys, H. S.

1. *Litteralis*, Scop. (Type).

Argentalis, Fab.

Reticularis, Lin.

Gen. 2. *Nascia*, Curt.

Ebulea, *H. D. Cat.*

1. *Acutalis*, Eversmann.

Cilialis, H.-S., *H. D. Cat.*, Hub. 119? Tr. 124? St.

53? Wood, 821? *

Gen. 3. *Stenia*, Guen.

Dolycarthria, St., *Cat. Brit. M.*

Margaritia, St., Ill.

Botys, Tr., Dup.

1. *Punctalis*, W. V. (Type).

Ætnealis, Dup.

Longipedalis, St., Curt., Wood, 825.

Fam. 4. HYDROCAMPIDÆ, Guen.

Gen. 1. *Cataclysta*, H.-S.

Hydrocampa, Lat., *H. D. Cat.*

1. *Lemnalis*, Lin.

Moniliata, Schæff. ic. 119.

♀, *Uliginata*, Fab.

Gen. 2. *Paraponyx*, St.

Hydrocampa, Lat., *H. D. Cat.*

Nymphula, Tr., H.-S.

* There is some confusion about this insect. M. Guenée points out that neither the figures, as quoted, nor the descriptions agree. Some of them apply equally to *Ebulea Catalaunalis*, which is not a British insect. The name here given is a modification of that of Eversmann, who figured the insect as *Chilo acutellus*. It is the *Edulea cilialis* of Doubleday's Cat.—C. R. B.

1. *Stratiotalis*, *Lin.*Paludata, *Fab.*, non *Lin.*Gen. 3. *Hydrocampa*, *Lat.**Nymphula*, *Schr.*, *Tr.*, *H.-S.*1. *Nymphæalis*, *Lin.*♀, *Potamogalis*, *Lin.*, *Wood*, 799, *St.* 38, *H. D. Cat.*2. *Stagnalis*, *Don.**Potamogalis*, *Schrank.**Nymphæalis*, *Haw.*, *St.* 29, *Wood*, 800, *H. D. Cat.*Fam. 5. BOTYDÆ, *Guen.*Gen. 1. *Botys*, *Lat.**Margaritia*, *St.**Eurrhyncha*, *St.*1. *Lupulinalis*, *Cl.**Nubilalis*, *Hüb.**Silacealis*, *Hüb.**Glabralis*, *St.*, *Wood*, 817? (*Ent. An.* 1856, p. 47).2. *Pandalis*, *Hüb.**Verbascalis*, *Hüb.**Terminalis*, *Haw.*, *Wood*, 816.*Angustalis*, *Haw.*, *Wood*, 816.*Oblitalis*, *Dup.*3. *Flavalis*, *W. V.**Lutea* (*Lithosia*), *Schæff. ic.*4. *Hyalinalis*, *Hüb.*5. *Verticalis*, *Albin.* (Type).6. *Lancealis*, *W. V.**Longalis*, *Haw.**Glabralis*, *Hüb.*7. *Fuscalis*, *W. V.**Cineralis*, *Fab.**Fimbrialis*, *St.* 56, *Wood*, 828.*Julialis*, *Schr.*8. *Terrealis*, *Tr.*8. *Asinalis*, *Hüb.* (*Meayna alsinalis*, *H. D. Cat.*)10. *Urticalis*, *Lin.*Gen. 2. *Ebulea*, *Guen.**Botys*, *Tr.*, *Dup.*, *H.-S.*1. *Crocealis*, *Tr.**Ochrealis*, *Hüb.**Verbascalis*, *Wood*, 824.2. *Verbascalis*, *W. V.**Arcualis*, *Hüb.**Ochrealis*, *Wood*, 820.3. *Sambucalis*, *Albin.*, *H. D. Cat.*

Gen. 3. *Pionea*, *Guen.*

1. *Forficalis*, *Lin.*
2. *Margaritalis*, *Fab.* (Type).
Extimalis, *Scop.* ?
Erucalis, *Hüb.*
3. *Stramentalis*, *Hüb.*
Elutalis, *Hüb.*, *Haw.*, *St. Cat.* 6833.

Gen. 4. *Spilodes*, *Guen.*

Epicorsia et Sitochroa, *Hüb.*, *St.*, *Cat. B. M.*
Botys et Scopula, *Tr.*, *Dup.*

1. *Sticticalis*, *Lin.*
Fuscalis, *Hüb.*
Tetragonalis, *Haw.*
2. *Palealis*, *Geoff.*
Selenalis, *Hüb.*
3. *Cinctalis*, *Tr.*
Verticalis, *Lin.*
Limbalis, *Schr.*

Gen. 5. *Scopula*, *Schr.*

Scopula et Udea, *Dup.*
Margaritia, part, *St.*, *Ill.*
Botys, *H.-S.*
Euresiphita, *Hüb.*

1. *Alpinalis*, *W. V.* (Type).
Uliginosalis, *Curt.*
2. *Lutealis*, *Haw.*
Institialis, *St.*, *Wood.* 829.
Pascualis, *Lien.*, *H.-S.*, *Isis.*
Etialis, *Guen.*, *H. D. Cat.*, *St.*, *Cat. B. M.*
Languidalis, *Eversm.*
3. *Olivalis*, *W. V.*
Umbralis, *Hüb.*
Nivealis, *Fab.*
4. *Prunalis*, *W. V.*
Leucophæalis, *Hüb.*
Nebulalis, *Haw.*
5. *Ferrugalis*, *Hüb.*
6. *Decrepitalis*, *H.-S.**

Tribe IV. *Plicatæ*, *Guen.*

Fam. unique. *SCOPARIDÆ*, *Guen.*

Gen. 1. *Stenopteryx*, *Guen.*

Botys, *Tr.*, *Dup. olim.*
Scopula, *Curt.*
Nomophila, *Hüb.*, *St.*, *Cat. B. M.*

* Said to have been taken by Mr. Hodgkinson and Mr. Buxton.—*Ent. An.* 1856, p. 32.

1. *Hybridalis*, *Hüb.*
Noctuella, *W. V.*
- Gen. 2. *Scoparia*, *Haw.*
Chilo, *Tr.*
Eudorea, *Curt.*, *St.*, *Dup.*, *H.-S.*
 1. *Ambigualis*, *Tr.*
Dubitalis, *Hüb.* 207? *Wood*, 1442.
 2. *Cembralis*, *Haw.* 498, *St.* 299, *Wood*, 1440.
 3. *Pyrallalis*, *W. V.*, *Haw.* 499, *St.* 299, *Wood*, 1443.
Dubitalis, *Germ.*
Tristrigella, *St.* 300, *Wood*, 1444. Var.
 4. *Muralis*, *Curt.* 4, pl. 170, *St.* 301, *Wood*, 1447.
 5. *Mercurialis*, *Lin.*, *St.* 302, *Wood*, 1449. (Type).
 6. *Cratægalis*, *Hüb.*
 7. *Resinalis*, *Haw.*, *Wood*, 1448.
Mercurii, *Fab.*
Delunalis, *Guen.*, *olim.*
 8. *Coarctalis*, *Zell.*
Angustea, *St.*, *Wood*, 1450.
 9. *Pallidulalis*, *St.* 300, *Wood*, 1445.

C. R. BREE.

Stricklands, November 11, 1856.

On Pupa Digging. By the REV. JOSEPH GREENE, M.A.

SOME years since a few remarks of mine on this subject were read before the Entomological Society. I imagined the matter to have excited little or no interest until I read, with, I trust, pardonable gratification, the following passage in an article addressed to the 'Intelligencer,' p. 74:—"Most of your readers will recollect a paper on digging for pupæ, which gave such an impetus to that mode of collecting." On reading this paragraph I forthwith determined that I would, if spared, write a few additional observations for the pages of the 'Zoologist,' in the hope that its readers might thereby be persuaded, in however slight a degree, to apply themselves with zeal to the only method by which their favourite study can be pursued during the long and dreary months of winter and early spring. I am the more induced to take this step, from the fact that I not unfrequently receive communications from my entomological friends and correspondents, making grievous complaints of their want of success; some asking information as to the "modus operandi,"—all inquiring, "What is the cause of my want of success?" In reference to the first of these questions, some remarks will be found at the close of this paper; in regard to the second,

"What is the cause of my failure?" I answer, Many causes doubtless combine to produce this undesirable result, such as want of experience, a sticky and clayey soil, unfavourable (*i. e.* wet) weather, &c. But I have no hesitation in expressing my firm conviction that, in nine cases out of ten, want of *success* proceeds from want of *patience*. A meets B. "Have you heard," enquires A, "of C's wonderful success in pupa digging? He has taken *dodonæa*, *Chaonia*, *Fagi*, *ocularis*, and I don't know how many rare insects." "You don't say so," excitedly replies B; "how is it done?" "Oh!" replies A, "simply enough: take a common garden-trowel and a box lined with moss; dig at the roots of any good sized tree, or tear off the moss, and the pupæ will tumble into your box *ad libitum*." Enthusiastic B rushes home, seizes a trowel, procures a box large enough to hold all the pupæ for miles round, and departs, buoyant with hope, upon his first pupa-digging excursion. "Let me see," he soliloquises, "what shall I do with my *surplus* pupæ? Ah! Mr. L. wants *trepida*; well, he shall have two: and, if I remember rightly, Mr. S., who sent me so many insects I did not possess, said he wanted *ridens*; therefore he shall have three." While thus meditating a majestic oak strikes his eye. "Lo!" he exclaims, "the very tree for both species!" Nervously, yet firmly, he grasps the trowel, and approaches the unconscious tree. Forthwith the trowel is inserted half a foot into the earth, and, by a prodigious muscular effort, a gigantic sod is turned up. Eagerly he gloats over and peers into the sod lying before him: nothing meets his eye but a writhing worm and a wriggling centipede. "Why, how is this? here's *nothing*!" With crushed hopes he is about to leave, when suddenly he remembers that he was expected to tap it gently, and then tear the roots asunder. The sod is tapped; an earwig! the sod is discerpted; a woodlouse! Perspiring with his exertions, with aching back, he rises from his knees, looking rather foolish. (N.B. The digger's feelings at this crisis, are often additionally lacerated by a small mob of boys, looking on with gaping mouths). He rises, I repeat, from his knees, takes up his huge box, and goes to a poplar: the same process—the same result. Then to a birch: ditto, ditto. This is too much! Angry and disappointed he hastens home, seizes a sheet of paper, and writes off to the author of "that paper" on pupa digging to ask, "What is the cause of my want of success?" Partly, my friend, ignorance of the proper method of setting to work, but, much more, the want of patience and perseverance. I know nothing which requires a more constant and vigorous exercise of these virtues than pupa digging. A *total* want of success is undoubtedly

disheartening, and accordingly, in the hope of encouraging despondent "diggers," I now append a list of insects, all of which have been taken by me in this way. Having this object in view, the commonest species are included, with a description of the tree, locality, time of appearance, &c. While this may prove uninteresting to the experienced, it will, I trust, be instructive to the beginner, for whom I write. Where no other locality is mentioned, Suffolk is intended. As there appears to be a *biennial* change in our nomenclature, I have thought it best to adopt, as most generally known and used, Doubleday's 'Synonymic List.'

Thecla Rubi. A pupa of this insect was once found under moss on a log of wood. Bucks.

Satyrus Ægeria. I have several times met with the pupa of this butterfly, suspended from blades of grass, when digging at the roots of trees. It is a beautiful grass-green colour, and passes the winter in that state.

Ægeria apiformis. *Vide* 'Intelligencer,' p. 18. This insect, though I have not seen it on the wing, seems to swarm here, judging from the number of pupa-cases in the trunks of poplars.

Smerinthus Tiliæ. Found commonly. Birch and elm. Prefers the narrow angles formed by the roots, getting in as far as possible. October, &c.

„ *Populi*. Common. Various poplars: edges rather than the angles. October, &c.

„ *ocellatus*. Scarce. Willows. October, &c.

Euchelia Jacobææ. This insect is, I believe, considered very common, yet I never took more than one specimen in England: far otherwise, however, in Ireland, where it abounds, and I have taken the pupæ in boundless profusion under loose bark on wych elms; of course the larvæ must have crawled up the trunks to form their cocoons, as they feed on the ragwort. I think it must be *local*, as that plant is very common here, yet I have not seen the insect.

Lithosia rubricollis. In abundance under damp moss, decayed bark, &c. Chrysalis short and stout, enclosed in a delicate white web. Should be occasionally damped. Fir, larch, oak, &c. October, &c.

„ *quadra*. Occasionally. Spun up on palings, in the neighbourhood of trees covered with lichens. End of June.

„ *griseola*. May be found under moss on lichen-bearing trees. June.

Phragmatobia lubricipeda and *Menthrastris*. Common. Spun up in loose rubbish collected about the roots of various trees. October, &c.

„ *mendica*. Rarely. Under moss on trees bordering damp ditches. Gloucestershire. October, &c.

Liparis monacha. This singular chrysalis may be found by examining the trunks of oaks, in the crevices of the bark of which tree it spins up. End of July.

Orgyia pudibunda. The conspicuous yellow cocoon of this species is easily detected among loose rubbish collected about the roots of trees; sometimes under loose bark. The larva is polyphagous, and consequently the pupa may be found at various trees. October, &c.

„ *Coryli*. Very plentifully under moss on beech: generally at the roots, and not on the trunk. October, &c. Bucks.

Eriogaster lanestris. I was much surprised at finding two pupæ of this pretty insect, the other day, at the roots of an *elm*: I thought it was exclusively a hawthorn-feeder, but there was no hawthorn at all near at hand. October, &c.

Trichiura Cratægi. The compact egg-shaped cocoon of this species I have once or twice met with at the roots of poplar, the larva having probably wandered from some neighbouring hawthorn. July.

Pæcilocampa Populi. This insect is found in various situations, and on various trees,—ash, poplar, &c.: sometimes it will be found firmly glued to the inside of a piece of loose bark or to the tree itself; at others spun up tightly among decayed leaves, dead grass, &c. It ought to be among the early captures of the pupa digger, as it is common, and not difficult to find. The cocoon is black. August and September.

Platypteryx falcata. Where birch is common examine the leaves joined together, and you will not unfrequently find the pupa of this species. June, and again in September, &c.

„ *unguicula*. Substituting beech for birch, the same remarks apply to this as to the preceding.

Cerura furcula. Under bark and on trunks of willow, occasionally. September, &c.

„ *bifida*. Occasionally on trunks and under bark of poplars. September, &c.

„ *vinula*. On trunks of poplar and willow. September, &c.

In regard to the two first of these insects, the best way, I think, to find them is to draw the finger slowly down the trunk, and carefully to examine the line thus formed and about an inch on each side of it;

they will generally be found at distances varying from one to three feet from the ground. You will almost invariably find *vinula* close to the ground.

Stauropus Fagi. Once found between two decayed beech-leaves. Halton, Bucks. October.

Petasia cassinea. One female at roots of elm. July. Gloucestershire.

Ptilodontis palpina. Occasionally at poplars, but much more frequently at willows, especially when on the banks of ditches, streams, &c. When in such situations, that side of the trunk which faces the stream is often clothed with grassy sods of loose, dry, friable earth: this is the place for *palpina*; shake the sod well, and the cocoon, which is grayish and of weak consistency, will generally be found among the dry roots: it is easily distinguishable from that of *dictæa*, being much smaller,—*i. e.* the cocoon,—and not so much mixed up with earth. End of September.

Notodonta camelina. Very common under moss on various trees, beech, elm, &c. A little experience will soon enable the beginner to detect it: the pupa is enclosed in a weak cocoon, and, unlike the other species in this genus, terminates in a single point or spike. October, &c.

„ *cucullina*. Once found under moss on a beech tree, having doubtless wandered from some neighbouring maple. October. Halton, Bucks.

„ *dictæa*. See remarks on *palpina*. This species forms a large cocoon, sometimes nearly the size of *trepida*.

„ *dictæoides*. I have found the empty pupa-cases of this species at the roots of birch? I put a note of interrogation, as, having never bred it, I am not sure.

„ *dromedarius*. The only pupæ of this insect I ever found were in Ireland: they were all, nine in number, taken at the roots of an alder, and produced the variety commonly known, I believe, by the name of *perfusca*: they seem to me very different from the English specimens of *dromedarius*. October.

„ *ziczac*. Rarely, at roots of poplar. October, &c.

„ *trepida*. This autumn I have succeeded in taking no less than seventeen of this fine insect: it appears to prefer a sandy soil, and does not seem so partial to *corners* as others of this genus. Oak. September, &c.

„ *dodonæa*. During the present and preceding autumns I have taken upwards of 300 pupæ of this species, mixed with *Chaonia*,

which is much rarer here, and goes down a full month earlier. Search as usual the dry friable sods collected in the corners, or the corners themselves without any sod. The cocoon is sometimes attached to the tree, but more usually among the roots: in either case great caution is necessary. It is a good plan, when you have pulled the sod out, to put your hand in and gently feel the trunk for any cocoons which may adhere to it. It is not easy to tell the difference between *dodonæa* and *Chaonia*; but the latter is, I think, stouter, smoother and not so glossy. Oak. September, October, &c.

Pygæra bucephala. Various trees. October, &c.

Clostera curtula. Seven. It is well worthy of notice, in regard to this species, that the larva enters the pupa state *on* the tree; I had imagined that it did so among *dead* leaves: this is not the case, at least not necessarily. When full-fed it joins two leaves firmly together, and remains there till they fall off. I was not aware of this fact till the present autumn: this hint may, I hope, enable others to obtain this apparently much-prized insect. I should add that they had not *turned*, when I found them, but they never came out of the leaves. Various poplars (shrubs, best). October.

Semaphora Psi. Common under bark on various trees. October, &c.

„ *tridens*. I have little doubt that the pupa I am in the habit of taking under bark on hawthorns is this species, but as *Psi* also feeds on that tree, and it appears impossible to separate the two species, except by breeding them, I am unwilling to speak positively. October, &c.

Acronycta megacephala. By no means uncommon under loose bark on poplars, occasionally on willows: it is not very easy to get at, as it enters into the smallest chinks. Break off every bit of loose bark with the point of the trowel, and the pupa-case, which, with the pupa, closely resembles that of *Psi*, will be found firmly glued to the surface. The cocoon is formed of decayed wood. October, &c.

„ *Aceris*. Five: all on *oak*, not *sycamore*. October, &c.

„ *Ligustri*. Abundant under moss on ash trees. The moss must be *very* carefully torn off: the pupa-case, which is black and very tough, not *hard*, will, in most cases, be found adhering to the moss: if there be no moss, examine the trunk. There are often long perpendicular slits in the bark of ash trees, and this is a favourite hybernaculum for *Ligustri*. If both moss and loose bark are wanting, go to another tree. October, &c.

Ceropacha Or. Very rarely under moss and dry rubbish on and about poplars. October, &c. Gloucestershire.

Ceropacha ocularis. Of this rare and beautiful species I took, last autumn, four; up to the present time I have taken nine more, four being unfortunately stung. The pupa is black and stout (something like *Coryli*), enclosed in an extremely delicate open net-work of a rusty brown colour: it is very difficult to find; it frequently, nay, generally, spins on the surface of spreading moss, or barely beneath it—sometimes between two leaves; in this latter case it is soon blown away, and, in the former, falls an easy prey to the first prowling mouse: it should, therefore, be sought for as soon as possible after the change: this, I think, should certainly not be later than the first week in October. Various poplars.

„ *ridens*. Of this also rare and very beautiful insect I took twenty-six last autumn; up to the present time I have only found seven. Like the last species, it is extremely difficult to find, and should be sought for as soon as possible, *viz.* middle and end of August.* The following directions may enable others to find it:—Detached oaks growing in *meadows*, of a dry, loamy soil, seem the best; the situation evidently preferred is the corners filled with dry rubbish and little stunted brambles. Insert the trowel well into the earth, six or seven inches from the *angle*, and turn up the sod, bramble and all, if possible: to find the pupa, after this is done, is a work both of time and pain; it will not do, in this case, to *tap* the sod. First carefully examine the dead leaves, for they frequently spin up in them: you must then, regardless of scratches, tear the roots asunder as gently as possible. The cocoon is very weak, composed of little bits of stick, dried leaves, &c., and requires delicate handling. Indeed, the whole concern demands an elaborate manipulation. This is one of those pupæ, to find which exacts a large exercise of the two virtues already alluded to. (N.B. Pupa diggers wearing *gloves* will return home with empty boxes). Oak.

Apamea unanimitis. The hybernating larvæ of this species may be commonly found under loose bark on willows growing near damp ditches in April. When you return home place them in a box with a little earth and moss, and, without further care on your part, the perfect insect will appear in June.

* I take this opportunity of correcting a mistake in the 'Manual' respecting the larvæ of this species and that of *flavicornis*. In that work they (the larvæ) are said to be found in *September*. This is a strange error: *flavicornis* is one of the earliest *spring* feeders, while *ridens* is found a little later in the season. I have taken the *pupa* of this latter, as stated above, in the middle of August, and, without any question, there is but *one* brood of both these species.

Xylophasia hepatica and *rurea*. Like the last named, I have found the larvæ (full-fed) of both these species in April under damp moss on stumps of trees, &c.: they require no attention. *Hepatica* I have generally found under damp moss on *poplars*.

Segetia xanthographa. This much abused, yet, when bred, pretty insect, may be found at the roots of most trees. End of July, August.

Noctua C-nigrum and *festiva*. Occasionally at roots of trees. July.

Chersotis plecta. Very common at roots of various trees. October, &c.

Agrotis putris. Very common at the roots of various trees. October, &c.

Tæniocampa stabilis, *instabilis*, *gothica*, *cruda*. Extremely abundant at the roots of various trees. October, &c.

„ *munda*. A few at roots of oak. Gloucestershire. October, &c.

„ *populeti*. Of this rare species I once found a “nest” of thirteen at the roots of a poplar. It goes much deeper into the earth than most other insects. Bucks.

The last eight species may easily be found by simply shaking the sod, or loosening the earth, and by taking a large number (I once had 1000 pupæ of *instabilis*) of the common species, some curious and beautiful varieties may be obtained without trouble.

Orthosia Upsilon. The larva of this species may be found in profusion under loose moss and bark on willows and poplars, but they must be fed. Beginning of June.

„ *macilentia*. Of this species, so difficult to obtain in good condition, when in the perfect state, I have found only three. The chrysalis, which is extremely delicate, is enclosed in a weak cocoon. Birch. September.

Cosmia diffinis. Not uncommon where elms abound. Spins up close to the trunk. End of July. Bucks.

Cirrædia xerampelina. Of this rare species I took forty-seven last year; this year I have only met with eight. It is perhaps the most difficult of all pupæ to find, and, when found, the most liable to be injured. The following directions may be found useful:—They are to be sought for at roots of ash: trees of a good growth need only be tried; those on the borders of streams and damp ditches will be found most productive. This insect forms a hard, egg-shaped cocoon. Turn up the loose dry earth, rubbish or moss about or adhering to

that side of the tree which faces the stream; crumble it *very* carefully with the hand: should you see something resembling a cocoon, of a dark, muddy colour, take it up and try whether you have obtained a prize; but in this trying lies the danger: though hard, the cocoon is extremely *brittle*, and almost the slightest pressure crushes it: the best way, therefore, when you think you have a cocoon, is to pare one end with a penknife as gently as possible: if, after scraping it in this manner, you find it is a cocoon, you have found *xerampelina*, and may congratulate yourself. You may look for it as early as the beginning of August, certainly not later than the first week of September. I may add that Mr. Doubleday informs me that the larva feeds on the seeds of ash trees.

Xanthia ferruginea, *aurago* and *citrago*. I have found all these species, though rarely, at roots of lime trees. August. Bucks.

Chariptera aprilina. In the utmost profusion: I have taken as many as twenty at one tree. This will be one of the first pupæ found by the beginner: nothing can be easier; merely turn up the earth, and break it, and they will tumble out of their brittle cocoons in plenty. Oak. July and August.

Hadena Persicariæ. Common under moss on various trees. October, &c.

„ *protea*. Not uncommon at roots of oak. Cocoon greatly resembles that of *xerampelina*. July and August.

„ *Pisi* and *thalassina*. May occasionally be found under moss, stones, stumps, &c., on or about heaths. October, &c.

Heliothis marginata. Once found, but I cannot say where.

Abrostola triplasia and *Urticæ*. They may both be found, though not commonly, under moss on ash trees throughout the autumn.

Catocala nupta. This fine chrysalis occurs not unfrequently under loose bark on willows: it never enters the earth, as far as my experience goes. August.

Botys urticalis. This is the only *Pylalis* of which I ever found the pupa, and, strictly speaking, not even of that, since it was the hibernating larva. It (the larva) may frequently be found enclosed in a comfortable cocoon under the bark of most trees; I shall not soon forget my disappointment when the perfect insect made its appearance.

Geometra papilionaria. At roots of oak. Beginning of July.

Eurymene dolabraria. This beautiful insect I used to take in plenty under moss on beech trees in Bucks: it occurs also, but much more sparingly, on oak. The larva enters the moss at the first con-

venient place, and therefore in tearing it off (which should be done with the *hand*, not the trowel), great care must be taken in loosening the *edge* of the moss, for *there* the pupa is, I may say, invariably found. October, &c.

Ennomos illunaria. I once found, as stated in my first paper, a whole brood of this species at the roots of one ash tree. Not met with since. September.

„ *fuscantaria*. Once found spun up at the roots of an ash. August. Brandeston.

„ *tiliaria*. Two or three spun up between blades of grass growing in the corners formed by the roots. Birch. August.

Odontoptera bidentaria. Common under moss everywhere. October, &c.

Crocallis elinguaris. The pupæ of this species may be taken in comparative plenty under moss on poplars about the end of June or beginning of July.

Anisopteryx æscularia. Not uncommon at roots of elm and oak. October, &c.

Hibernia leucophaæaria. One female at roots of, I think, a sycamore.

„ *rupicapraris* and *progemma*. Very common at roots of elm throughout summer and autumn.

„ *aurantiaria* and *defoliaria*. Also common in the same situations. Should be looked for not later than September.

The above four species may be found in little “clusters” in dry nooks formed by the roots of elm trees, and beautiful varieties thus procured: much trouble in looking for the apterous females will also be saved.

Phigalia pilosaria. Common at roots of elm. October, &c.

Biston hirtaria. Common at roots of ash. This pupa may be known by a row of dull yellow spots on each side. In October, &c.

„ *prodromaria* and *betularia*. Both common; the former at roots of oak, the latter at those of elm. October, &c.

Boarmia abietaria. Found in profusion at roots of fir trees in Gloucestershire. Last week in June: this time should be strictly adhered to, as the insect sometimes remains only eight days in the pupa-state.

Tephrosia laricaria. Several, in the New Forest, under moss on oak trees. October, &c.

„ *consonaria*. This insect appears in the perfect state about the first week in May: the pupa should be looked for, in April,

under moss and at the roots of beech: it appears to be exclusively attached to that tree. Bucks.

Harpalyce ruptaria. Common at roots of elm and lime. The pupa is enclosed in a web-like cocoon, and is greenish yellow, powdered with brown spots. October, &c.

„ *russaria* and *immanaria*. Common at roots of willows.

Ypsipetes elutaria. In abundance at roots of willows: most extraordinary varieties may be thus obtained. July.

„ *impluviaria*. Common under moss on alders. October, &c.

„ *ruberaria*. I once took about a dozen of this insect under loose bark on poplar. Bucks. April. The larva hybernates, I think; for, if I remember rightly, some had not turned when I found them in the spring.

The pupæ of the three last-named species are all black and very active.

Phæsyle miaria. Very common at roots of willows. August.

„ *Psittacaria*. Much rarer. Birch and sycamore.

The pupæ of both these species (together with that of *Epione apiaria*, which I forgot to mention in its right place) may be found spun up in loose grass, or attached to the trunk: the latter species at willow. The pupæ of all three have a purple bloom, and I cannot see any difference between them.

Cheimatobia dilutaria and *brumaria*. These two common insects may be found in the utmost profusion at the roots of almost any tree throughout the summer. There appears to be an impression on the minds of some that *autumnaria* and *filigrammaria* are only varieties of these species. Of course the best way to decide the question is by breeding them: this I have not done, but out of many hundred pupæ of *dilutaria* I have never had anything like either of them. I am aware that, up to this time, they have only been taken in Scotland, or, at any rate, in the North. As I have had no "digging" in either of those localities the above fact may be thought of little value. I would venture to recommend the northern collectors to dig at the roots of *elm* and *oak* any time during the summer, and to collect as many pupæ as possible. (N.B. I suppose every one knows the pupa of *dilutaria*.) Should the three insects, or two of them, be or not be produced from these pupæ, it would, I think, assist considerably in solving the question. In my opinion all three are abundantly distinct.

Eupithecia exiguaria. Occasionally under bark on hawthorn. October, &c.

Eupithecia abbreviaria. Occasionally under bark on oak. October, &c.

„ *castigaria*. Occasionally under bark on hawthorn. October, &c.

„ *innotaria*. Of this rare species I have been fortunate enough, at different times, to take seven. I believe the food of the larva is not ascertained, but I have little doubt that it feeds on ash, as all my pupæ were taken under moss on that tree. To find it, see directions under the head of *Eurymene dolabraria*. October, &c.

„ *dodonæaria* (*subumbraria*, *Doub. List*). This very pretty insect I am in the habit of taking under loose bark on hawthorns throughout the winter and spring. It is enclosed in a delicate web.

REMARKS.

1. The above list, it will be seen, comprises no less than 113 insects, including many of the rarer species. It might have been considerably increased by adding others, which may occasionally be found in digging gardens, stubbing up roots, turning sods of grass, &c.; but as no fixed rules can be laid down in reference to these methods, or, to speak more correctly, since I can give none, I have confined myself strictly to *trees*, on or about which all the above may be found by assiduous collectors.

2. An examination of the list will show at once that the following trees are the most productive, *viz.*, poplar, willow, oak, elm, birch, beech, ash and hawthorn. But *all* trees should be tried. Knock off the loose bark and loosen the moss on every tree you pass. I do not think there is much use in digging at the *roots* of any trees, except those mentioned, unless a particular insect be wanted, such as *Boarmia abietaria* or *Trachea piniperda*, at roots of fir, &c., &c.

3. It will also be seen, by referring to the list, that in a very large majority of instances September and October are quoted as the best time for searching; and this is undoubtedly the case. From whatever cause or causes, such as mice, damp, mould, earwigs, &c. (I have *seen* earwigs eating a soft pupa), chrysalides become scarcer and scarcer as the season advances, meaning by the term *season* winter and spring. If the collector, therefore, wants any particular species, obviously his best plan is to search for the pupa as soon as possible after the larva has gone down or spun up. Assuming that the collector knows the period when the insect he wants is feeding as

a larva, and its probable or usual duration in that state, a little experience will soon enable him to know how soon he ought to dig for the pupa. A fortnight will generally be found ample time. Let us take *Notodonta dodonæa* as an example. The larva of this insect is full-fed about the 25th of August. Allowing, then, a fortnight for the change, the collector should begin to dig about the second week in September; and during the ensuing three weeks of that month he will probably find more specimens than during the whole of the remainder of the season. Of course *all* the larvæ of the same species are not full-fed on the same *day*, many causes combining to produce some uncertainty in this respect; but, as a rule, the variation is not considerable. But though, for the above reason, the pupa digger should be unusually active in his exertions during September and October, let him by no means afterwards sink into inglorious ease, content to rest on his laurels. Pupæ may be found all the year round. I seldom let anything like a fine day pass without taking a good walk into the country, trowel in hand; and if I return home in January with only *two* pupæ, instead of the *eight* which I might very probably have taken in October, I am quite satisfied. Successful or unsuccessful, I can confidently recommend the *exercise* to the corpulent and obese.

HINTS.

At the risk of appearing tedious, I append a few observations as to the method of digging, the best localities, &c. I am aware that these observations have, for the most part, appeared elsewhere; but, considering that this paper would be incomplete if they were entirely omitted, I must ask the indulgence for recapitulating some of them.

The only implements required are a common garden trowel and a small box filled with damp moss, for the purpose of carrying the pupæ, which should be handled as seldom as possible, and with the utmost tenderness. I may here remark that the pupa digger must not be surprised or disheartened if some of his pupæ dry up. This is caused by some unlucky, probably *unseen* injury, inflicted at the time of capture, and, however great his caution, will not unfrequently occur. But to return:—With regard to localities, the best are unquestionably parks and meadows with *scattered* timber trees. Those trees from which the surrounding grass has been worn away by the feet of cattle, and those situated on the borders or banks of streams, dykes, &c., when the soil is dry and friable, will be found the most remunerative. When the pupa digger enters on new hunting-ground,

let him endeavour to attain an eminence which commands a survey of the surrounding fields, &c. Having accomplished this, let him cast a scrutinizing glance around. Should a lofty oak or a stately poplar be seen rearing itself in *solitary* majesty in the middle of a field, let him rejoice; and, having hastily descended from his not "bad" eminence, let him at once proceed to it, regardless of hedge and ditch. If there be a nice dry sod, ensconced in some snug corner, formed by the roots, he can scarcely fail of success. Insert the trowel, *in this instance*, about eight inches from the trunk, to the depth of four. Turn up the sod and lay it on the ground. Look then at that part of the trunk from which the sod has been removed, and, if you cannot see, feel gently with the hand for any cocoons which may adhere. Then take the sod in the left hand and tap it softly with the trowel, and the pupæ which form no cocoon, or a very weak one, such as *Aprilina*, *prodromaria*, &c., will drop out. If the sod be composed of very loose, dry earth, simply shake it. Lastly, tear the roots asunder for *Bombyces*; if, however, the roots be strongly matted together there is little or no use in doing this. Before leaving the tree, see if there be any nooks or crannies formed by loose bark, in which case break it off with the hand if possible; if, however, this cannot be done, wrench it off with the trowel, observing that it should not be inserted further than is *absolutely* necessary. It is astonishing into how small a hole or crevice a caterpillar will creep. If, therefore, an insect such as *megacephala*, which spins up under the bark, be wanted, these little nooks must be carefully and *cautiously* examined. If moss be on the trunk or roots, tear it gently off, and search both the moss and the trunk. When these operations are ended the tree may be looked upon as "done for." In digging *round* a tree, by which I mean one whose roots do not form any angles, it is not necessary to insert the trowel deeper into the earth than three inches, or further from the trunk than four. With regard to woods, I can add nothing to what appeared in my first paper, from which I make the following extract:—"It is in vain to examine the *dense* portions; it is equally vain to dig at the *roots* of trees in such localities, with few exceptions; and you will rarely find anything, unless upon trees of a considerable growth. The thick moss which collects about the trunk and roots is the part to be examined. 'Bombyces' are generally (almost invariably) found under the moss which covers the spreading roots, and not on the trunk. The best localities in woods are the borders and open places; and it is curious that such places, when elevated or facing the North, seem to be the most productive."

Touching hedgerows, I must so far modify my former wholesale condemnation of them as to say that I found two pupæ of *ocularis* in such a situation this autumn. It should be borne in mind that in condemning hedgerows I condemn the *trees*, not the hedgerows. As Mr. Douglas justly remarks, in his highly interesting and instructive little book, the 'World of Insects,' p. 116, "Pupæ must be there," *i. e.* in the *banks* on which the hedgerows are. I shall most thankfully receive any information as to the *modus operandi* in this case from those who have tried it. I imagine that *Noctuæ*, and not *Bomyces*, will generally be found in such situations. In the occasional records of insects taken in the pupa state I observe the frequent use of this expression, "Pupa, by *raking*." What is the meaning of the term "raking?"

There is no use in trying hard, sticky or clayey ground; but the following hint will be found valuable: always *replace* the sod when you have done with it, or at least the *débris*. When first taken up the sod may be so hard as to render it impossible for the caterpillar to penetrate it; but if, after being loosened by the pupa digger's manipulation, it be restored to its place, the larva, which in the original instance would have wandered away to some more convenient spot, will now find one ready-made, and will almost certainly make use of it. This has been evidenced to me in the most unmistakeable manner, in proof of which I may adduce the following example:—One day, last June twelvemonth, I came to a most unpromising-looking oak. Observing a little angle, I inserted the trowel, and found the soil as hard as a board; nevertheless, I turned up the sod, shook it, and, having found nothing, loosely replaced it. In the following September I returned to the same tree, and, having unsuccessfully dug round it, came to my little (it was not more than three inches each way) sod, and raised it with anxious hand, when, lo! to my delight and astonishment, *five* pupæ of *Notodonta dodonæa*, all joined together in a little cluster! It is obvious that the above plan will be of no use during the winter months, but can only be made available while the larvæ are feeding, *i. e.*, in the late spring and early summer months. It will then be said, "You dig all the year round?" I answer, certainly: September and October are the most *productive* months, it is true; and August and September will be found the best time for the autumnal species; but that is no reason why the other months should be neglected. Of course I dig much more sparingly during the spring and summer, at which period insects may be taken in the larva and imago state; but I seldom go out without my trowel; and I can con-

fidently recommend the collector in want of any particular tree-feeding Bombyx or Noctua to prepare a comfortable home for the larva, in the manner given above.

When the ground is very wet do not try *digging*. Rather examine moss, loose bark, &c.

With regard to the question, which will probably be asked by my readers, "Which are the most *likely* trees?" I answer that general directions on that head will be found scattered through the paper; and I would only add in this place that it appears to me useless to try any trees but those of considerable growth, and that when the trunks or roots of such trees are thickly matted with ivy no pupæ will be found. But the uncertainty on this point is truly extraordinary. In my first paper I gave an instance; I now subjoin another. In the neighbourhood of Brandeston is a park, belonging to the Duke of Hamilton, which is filled with fine old timber oaks, and is a grand hunting-ground for the pupa digger. On one occasion I came to a meadow, adjoining this park, in which were about sixteen oaks, all fulfilling the necessary requisites for "likely" trees, old, filled with angles, and a dry soil. Out came the trowel, the box was prepared, and I began with number one. I dug for about two hours; at the expiration of that time I looked into my box, and found the result to be three instabilis. There remained one tree, which did not seem to offer any advantages over the others; yet at that one tree, in a corner, about the size of a good large plate, edged with loose grass, I took the following, *viz.*, three trepida, *seventeen* dodonæa, three prodromaria, seven hirtaria, and two or three dozen cruda, gothica, plecta, &c. This is a simple *fact*, and in reference to it I would ask, "Can any one assign even a plausible reason for so singular a circumstance?" The same thing, though in a less degree, occurs every day, and seems to set at nought anything like fixed rules.

If this paper be of any use in enabling the collector to fill up some of the blanks in his cabinet with his own hands (and who would not rather do so with his own hands than with those of others?), I shall feel well repaid; and any letter addressed to me as below shall be willingly and promptly attended to where further information may be desired.

That pupa digging is much on the increase I infer from several circumstances, among which I may mention the comparatively frequent record in the 'Intelligencer' of insects captured in this way. Surely the most desponding must be nerved to renewed efforts when

he reads that *bicuspis*, *ilicifolia*, *fluctuosa* and *conspicillaris* (8) have rewarded the enthusiastic pupa digger.*

In confirmation of the above opinion, I here give an extract from the letter of a highly-esteemed correspondent, Mr. Bree, of Stowmarket:—"I met some young boys, a day or two ago, digging round some trees. To my horror I found that they had read of the— (modesty forbids my giving the adjective here added) Mr. Greene in the 'World of Insects,' and were exterminating all my game. They had got about a dozen under an elm tree!" I hope Mr. Douglas may be as much pleased with this circumstance as I was.

I hope it will be borne in mind by my readers that the remarks, hints, &c., contained in this paper, are not intended as incontrovertible dogmas, but merely as the results of my own experience and observation.

And now I will conclude with one, literally *one*, word of advice to the incipient pupa digger, and it is this: PATIENCE!

JOSEPH GREENE.

Playford, Ipswich,
November, 1856.

Entomological Botany (with more especial reference to the Plants frequented by the Tineina). By H. T. STAINTON, Esq.

(Continued from page 5238)

Pyrus Cydonia. The Quince Tree.

Quince trees are often grown in gardens, and they are not inelegant trees, though perhaps now rather old-fashioned. The only insect that I have to mention in connexion with the quince tree is a *Lithocolletis*. This notice may have the effect of calling the attention of collectors to the leaves of the quince tree; and a *Lithocolletized* leaf will add a new species to our Fauna.

The insect (though not improbably the original *Cydoniella* of the 'Wiener Verzeichniss') is a recent discovery, M. Millière, of Lyon, having collected the mined leaves there, and forwarded them to Professor Frey at Zurich, who bred the insect this spring. As might be

* If this should meet the eye of Mr. Smith, will he be so obliging as to state when, where and how he obtained the pupa of the last-named insect?

expected, the insect belongs to the *Pomifoliella* group; but the redder tint of the anterior wings and the absence of white scales on the inner margin near the base readily distinguish it.

Sorbus aucuparia. Mountain Ash.

Though so completely domesticated in suburban gardens, its name *mountain ash* reminds one of its native haunts, where, in some glen on the hill-side where the burn comes brawling down, leaping over the "muckle stanes" with which the bed of the torrent is strewn, the graceful appearance of this tree harmonizes so well with the scene. In such localities, whilst watching *Argynnis Selene* flying up or down the ravine but we digress. Speyer enumerates as feeding on this plant *Zeuzera Æsculi*, *Gastropacha betulifolia*, *Hypercompa dominula*, *Acronycta strigosa*, *Diphtera ludifica*, *Scopula prunalis*, *Nola cucullatella*, *Tortrix Ribeana* and *cinnamomeana*, *Penthina pruniana*, and *Spilonota ocellana*.

Among the TINEINA feeding on the mountain ash may be mentioned *Cheimabacche Fagella*, *Argyresthia conjugella* (feeding in the berries) and *Sorbiella*, *Ornix Scoticella* and *Loganella*, *Lithocolletis Sorbi* of Frey, which we have not yet detected in this country, unless *L. aucupariella* of Scott be a northern variety of it, *Cemiostoma scitella* and *Nepticula Oxyacanthella*; probably, also, other of the hawthorn- or apple-feeding species of *Nepticula* patronize the *Sorbus aucuparia*.

Sorbus torminalis. Wild Service Tree.

This plant is generally, I fancy, but little known, though not rare in our southern hedges; the leaves remind one rather of the leaves of some species of poplar, but are slightly woolly on the under side: it generally only forms bushes in hedges, but sometimes we meet with a small tree.

Speyer quotes as feeding on it *Notodonta cucullina* (probably a mistake, as the plant has no affinity with maple, though here they grow in company) and *Hibernia defoliaria*.

The most important insect feeding on it is a *Lithocolletis*, which has been named by Frey, after its food-plant, *Torminella*; it mines the under side, and belongs to the *Pomofoliella* group, being distinguished by its pale saffron ground-colour and pure white markings. The larva of this species is not uncommon on the *Sorbus torminalis* at the beginning of August and October. The perfect insect is described in

the 'Entomologist's Annual' for 1857. The mine of a *Nepticula* larva has been noticed, but the larva itself has not been met with.

Epilobium. Willow Herb.

Speyer mentions as feeding generally on this genus *Macroglossa Enotheræ* (one of the loveliest of the Sphingina, but which up to the present time has not made its *début* in Great Britain), *Hypercompe Hera* (so common in the Channel Islands), *Spilosoma lubricipeda*, and the equally omnivorous *Sericoris urtica*. *Laverna conturbatella*, which he also mentions, I reserve for more special consideration under *Epilobium angustifolium*.

Epilobium hirsutum. Great Willow Herb.

This is quite an ornamental plant along many a river-bank and marshy place, in the months of July and August. Then its large rose-coloured flowers are very conspicuous, though the plant does rather suffer from a superabundant foliage.

Speyer mentions as feeding on this species *Chærocampa Elpenor* and *porcellus*, and *Nænia typica* (which, when juvenile and gregarious, often completely skeletonizes the leaves of a plant). In the genus of *Tineina*, *Laverna*, two species at least are very abundant here on this plant: I allude to *Laverna ochraceella*, of which the larva bores in the stems in May, quitting the stem when full-fed, in order to form its cocoon inside the cuticle of one of the lower leaves; and *L. Epilobiella*, a number of the larvæ of which may be found on the head of almost every plant in July, they feeding externally on the young buds and tender leaves.

There is a singular partiality on the part of the larvæ of the genus *Laverna* for the various species of *Epilobium*; and *E. hirsutum*, being the most plentiful and the most extensively distributed, seems to be most largely patronized. Mr. T. Wilkinson has bred *L. propinquella* from either *hirsutum* or *alsinifolium*: Herr Schmid has bred *L. lacteella* and *Raschkiella* from *E. hirsutum*, and it is known to be one of the favourite plants of *Anybia langiella*.

But how monstrous is the difference in the mode of feeding exhibited in the genus *Laverna*! Whilst *ochraceella* bores the lower part of the stem, *Epilobiella* feeds externally, on the young buds, &c., at the summit; then *conturbatella* rolls together several of the heart-leaves; *Raschkiella* makes a long, slender mine; and *Anybia langiella* (which Frey unites, not unwisely, to the genus *Laverna*) makes large

blotches, often as large as the leaves. In this respect its mines resemble those of the pretty *Chrysoclista Schrankella*, which, though apparently more partial to *E. alsinifolium*, s s ometimes found on *E. hirsutum*.

Epilobium angustifolium. Rose-bay Willow Herb.

An elegant plant, without the dense foliage of *hirsutum*, and with longer spikes of more conspicuous flowers. It is often grown in gardens, thriving well in damp, shady places: such are its usual resort. I had occasionally noticed a few plants of it, but had never met with a bed of it, apparently wild, till this last summer, when, in the wood on the summit of the cloud-attracting Box Hill, I found a congenial locality, a *damp, shady* place, and there *E. angustifolium* grew in profusion, in company with the pretty little enchanter's nightshade (*Circea lutetiana*).

Speyer mentions as feeding on *E. angustifolium* *Chærocampa Elpenor*; but its patrons which most deserve our consideration are three of the *Tineina*, two of which the exertions of Mr. Machin and Mr. F. O. Standish have added to the British list during the past season; they having found both of them in the aforesaid wood on the top of Box Hill. (The entomologists of Dorking and vicinity leave the treasures of their neighbourhood to the energy of the London collectors). The first species found was *Laverna conturbatella*, and its discovery was promptly followed by that of *L. Raschkiella*. The larvæ of both species were subsequently met with; under *E. hirsutum* I have already noticed their different modes of feeding.

The other larva attached to this plant, and which we have not yet found here, is *Butalis inspersella*, of which Zeller, quoting a letter from Schläger, gives the following account in the '*Linnæa Entomologica*,' vol. x. p. 253. "On the 18th of June I found, in the clusters of blossoms of *Epilobium angustifolium*, white, rather thick webs, which were quite full of small larvæ. They were still mostly very young, and hardly a fourth of an inch long; yet some were twice that size, and others even larger. In the corners of my cage they made white, transparent cocoons, in which to change to pupæ. The perfect insects appeared in about fourteen days. The web which the larvæ of *inspersella* inhabit is rather large, encompassing some of the uppermost leaves, and is much laden with grains of excrement. It reminds one somewhat of a nest of an *Hyponomeuta*."

Laverna subbistrigella has also been bred from this plant, but its habit has not yet been observed.

H. T. STAINTON.

Mountsfield, Lewisham,
October 20, 1856.

On Nomenclature.—Nomenclature is a sore subject; everybody abuses it,—everybody says it is nonsense to have more than one name for an insect,—and yet every one who writes on Entomology, whether it be a monograph of a genus or a manual of a class, is sure to change some names previously considered correct by some one. This is undoubtedly very annoying; but can it be prevented?—does it not arise, of necessity, from the circumstances of the case? When a person reads up any branch of the Science, and finds a description which he has no doubt applies to a certain insect, and which bears an earlier date than the name by which that insect is more generally known, it seems to me that he has no choice in the matter, but must change it, for I believe it is generally allowed that priority is the only sure guide in this case. If every one could be persuaded to adopt some one standard it would undoubtedly be a great advantage; but how is this to be done? Your correspondents recommend Doubleday's 'Synonymic Catalogue,' and very probably there are in this country at the present time more collections arranged by that than by any other; but some of the older collections are already arranged by Guenée's works, and there is no doubt but a large proportion of those now beginning to collect will adopt Stainton's 'Manual,' and both these works, being accompanied by descriptions, have an authority and stability which are wanting in the other. It seems to me a difficulty and annoyance to which we must make up our minds, and I think it is one to which Englishmen should be especially forbearing, resulting as it does from that right of private judgment which we all prize so highly.—*Thomas Boyd*; 17, Clapton Square, October 6, 1856.

Mr. Stainton's Arrangement of Lepidoptera.—I cannot agree with the protest signed by four of our entomologists and published in the 'Zoologist' (Zool. 5289), and confess I am a heretic with respect to the infallibility of any list or arrangement of Lepidoptera in the present state of our knowledge, nor do I think the views embodied in the said protest are calculated to advance the progress of Science, or that they will receive the assent of the intelligent author of the 'Synonymic List' himself, who, I am pretty sure, in a second edition, will not follow the same plan as in the first. Truth must be our standard, and not any particular list or arrangement. I believe there are errors of classification and nomenclature in all our lists, Mr. Stainton's not excepted, but he can only "mislead beginners" where he is in error. Systematic Entomology will make no progress towards perfection if no changes are to be permitted; but, at the same time, those who make them should do so with care and truthfulness, not from caprice, and when they find themselves in error should not hesitate boldly to correct it.—*R. F. Logan*; Duddingston, Edinburgh, November 4, 1856.

Figures of Larvæ of Lepidoptera.—I have great pleasure in informing any one who would like to have good figures of larvæ that the Mr. Diggles named by Mr. Stevens (Zool. 5307) is really a first-rate artist and a most indefatigable Micro-Lepidopterist: having had the pleasure of his acquaintance many years, I can speak from having seen

his work; and when I say it was he who painted the beautiful figure of *Gastropacha ilicifolia* on rice-paper which Mr. Douglas exhibited for me at the Entomological Society's rooms some time since, I need not say more for his care and skill as an artist. When Mr. Diggles left England Science lost one who could not only paint Natural History, but who knew what he was painting. Such a man seems to be wanted now, and should Mr. Diggles ever return to England I hope he will make London his home, and that London will make him a better home than Birkenhead did: his talents were indeed under a bushel there.—*C. S. Gregson; Edge Lane, Stanley, Liverpool, November 16, 1856.*

Lasiocampa Callunæ.—I have waited a long time in the hope that some able entomologist would take upon himself the task of fully establishing this fine Scottish egger, but, as no one has done so, I beg to give a brief statement on the subject, which is the result of several years' practical observation (I having found the first larva in 1844, on Rannoch Moors), and which will, I think, satisfactorily show the specific difference of this, the largest known British species of the genus. The insect is of a darker colour than *L. Quercus*, and its antennæ are about a third longer, each consisting of eighty-four minute articulated pieces, while that has but sixty-four. There is a more conclusive difference between the larvæ of the two insects, that of *L. Callunæ* being more or less bluish in parts, and the under side being brownish, with a row of large black spots. The cocoon (though larger) resembles that of *L. Trifolii*, being roughish, and of a dark brown colour, and therefore unlike that of *L. Quercus*. I may mention of this interesting species that it always requires two entire years for its transformations. I am fully aware that *L. Quercus* and some others occasionally pass a second winter in pupa; this, however, constitutes the exception, not the rule. In 1854 I sent some of the larvæ of *L. Callunæ* to Mr. Doubleday, with whom an eminent French entomologist was then staying, and both at once pronounced them to belong to an unrecorded species. The name of *L. Callunæ* I have not yet seen in any list of British insects, but it is distinctly named in some of our best cabinets.—*Richard Weaver; 25, Pershore Street, Birmingham, November, 14, 1856.*

Double-broodedness of Notodontæ.—It appears that Mr. Shepherd requires a great deal of evidence to prove dictæa and others of the Notodontæ double-brooded, and the sort of evidence he requires I do not understand. He has bred it double-brooded himself, it appears; but that is no evidence with him, because the larvæ are so well treated in his breeding-cage that he thinks they come to maturity sooner than they would if left to their own resources. Also taking two broods, one in May and the other in August, is no evidence with Mr. Shepherd, unless he receives proof that the insects taken in August are descendants of the May brood: now it appears to me that if breeding them will not prove it nothing will; but, as Mr. S. will not take this kind of evidence, I should like to know how it is to be proved at all (supposing the insects are double-brooded). Should we take the female in May, and breed a second brood in August, it will be put down to their being too well treated and brought to maturity sooner than they otherwise would; and, if we take a second brood in August, Mr. Shepherd says, very coolly, "prove their descent." Now, if breeding them will not prove it, how is it to be proved? and, if it will, I think Mr. Crewe's last letter (*Zool.* 5292) sufficient to do so. The first brood of *N. dictæa* appears here in May, and when they appear first are of course in fine condition; they soon get over-flown, and early in June are not to be met with. In about the last week of July or beginning of August the second brood make their appearance in fine condition, quite as plentiful as the first brood, though rather smaller and paler: I know of at least from thirty to forty

specimens having been taken here last August. Can Mr. Shepherd account for this August brood? Besides *N. dictæa* we find *N. dictæoides*, *N. ziczac*, and *N. camolina* occur in August as well as in May. I fancy it is a long time for a single brood to last from May to September, as both Mr. Naish and myself have taken *N. dictæa* in the latter month this season. Besides, if they are only single-brooded, what becomes of them during the greater part of June and July? Perhaps Mr. Shepherd could enlighten me.—*George Harding, jun.; Stapleton, Bristol, November 12, 1856.*

Double-broodedness of Notodontæ.—Mr. Shepherd says that to complete my chain of evidence that *N. dictæa* is double-brooded I must "prove that the moths which emerge in May are the parents of those found in July." Now this fact has been so fully proved by Mr. Crewe, with respect to many of the *Notodontæ*, that it hardly needs any further confirmation; but knowing that Mr. Gascoyne had bred *N. ziczac* pretty freely, I wrote to him, asking him if he could confirm Mr. Crewe's letter. The following is Mr. Gascoyne's reply, dated November 5th:—"I have no hesitation in answering your enquiry in the affirmative. The correspondence now going on as to the double-broodedness of the *Notodontæ* seems to arise less from facts being questioned than from a difference as to what these shall be called, yet perhaps the following may not be unacceptable. I have at this time two sets of pupæ of *N. ziczac*, probably about seventy in number; these are in direct descent from moths of last May; the first brood of larvæ assumed the pupæ state the middle of July, the moth (second brood) appearing the beginning of August: eggs from those, the produce of two pairs (each set numbering about 110), hatched in four or five days, and the larvæ assumed the pupæ the latter end of September. I feel no hesitation in saying that I could continue to breed moths in May and August for years to come (accident excepted). The dates of the respective states appear thus:—imago, May and July; larva full-fed, July and September; pupa, July and winter. It thus appears that, while the winter pupa remains in that state eight months, the summer one passes it in about a fortnight. I may add that all the July pupæ emerged: none remained over. I am satisfied the same is the case with *N. camolina*: I had the imago alive in June last, from larvæ taken the previous autumn, and again bred it in August from larvæ fed during July; part of the latter brood is still in pupæ, doubtless a provision of Nature to meet casualties to the autumn brood." I may add, with respect to *N. dictæa*, never having bred them from the egg, I cannot from personal knowledge give the required information; but this link in the chain is amply filled up by other gentlemen. The mere fact of many of the pupæ of the *Notodontæ* remaining over from one year to another does not, in my opinion, prove much, as Mr. Gascoyne tells me that he has now the pupæ of *S. Carpini*, which attained that state last autumn. Mr. Shepherd would hardly argue from this fact that *S. Carpini* is biennial-brooded.—*Arthur Naish; Brooklyn Lodge, Ashley Hill, Bristol, November 7, 1856.*

The Notodontæ not double-brooded.—

"Truth can never be confirm'd enough,

Though doubts did ever sleep."—SHAKESPEARE.

Doubts are considerably troublesome to many people; I wish I had none myself. Those who, on any subject, have no doubt in their own minds are in a very enviable position; and to do anything to disturb such a desirable condition appears ungenerous, if not somewhat cruel. I wish to make a few observations upon the so called double-broodedness of *Clostera reclusa*, *Notodonta camolina*, *N. ziczac*, *N. dictæa* and *N. dromedarius*, insisted on so strongly in the 'Zoologist,' at pp. 4952,

5148, 5292. As Mr. Harpur Crewe has "no doubt whatever in his own mind" but that this so-called double-broodedness is "a wise arrangement of Providence," I should advise him not to read what follows, lest by possibility it might awaken a doubt in his mind respecting the wisdom of those arrangements, touching the moths above named. The replies of Mr. Doubleday and Mr. E. Shepherd (Zool. 5165) will probably be considered satisfactory by most entomologists, as they are to me. Wishing, however, to confirm the truth of this Notodonta question, I have learned all I can respecting the economy of these moths in Scotland, including the experience of a person who has bred the four species of Notodontæ every year for six years past in considerable numbers. I can find only one specimen was ever seen in the autumn—a solitary *N. ziczac*, which became perfect in captivity on the 15th of August, 1855, out of a brood reared from eggs hatched on the 26th of June; the remainder did not become winged till this year. This summer I collected a large number of larvæ of *Notodonta camelina*, *N. ziczac*, *N. dromedarius* and *Clostera reclusa*, also a few of *N. dictæa*: they were of all sizes; some became pupæ very early, but none have yet become perfect, and I do not expect they will till next May or June, seeing they are now enjoying a temperature of 28° Fahr. I give below the times of the imago appearing, from larvæ that have fed in the previous summer and autumn. The earliest and latest dates are given between which the moths "kept coming out." They are taken from specimens bred during the last five years:—*Clostera reclusa*, May 13, June 20; *Notodonta dromedarius*, May 7, July 1; *N. ziczac*, May 7, June 18; *N. camelina*, June 1, 27; *N. dictæa*, May 13, July 12, and, in the year 1853, so late as July 27th and August 5. I would direct the particular attention of Mr. Naish to the "long range" in the time of appearance of *N. dictæa*, as illustrative of his "stubborn things" (Zool. 5265). I believe some species among the Lepidoptera which appear here only once in a season (though very regularly) appear twice in a season in England: if this variation be owing to the "wise arrangements of Providence" being restricted to the southern part of the island, and not to a difference in climate, it is time the injured animals made known their grievances to the "Scottish Rights Association."—*Thomas Chapman; Glasgow, December 3, 1856.*

Capture of Glæa erythrocephala at Plymouth.—I intend to exhibit, at the January meeting of the Entomological Society, a specimen of *Glæa erythrocephala*, captured at Plymouth: it was taken by myself, at sugar, in November. This has been compared by Mr. Henry Cooke, of Brighton, with the unique specimen in his possession, and, like that, proves to be the *var. glabra* of Duponchel.—*J. J. Reading; 42, Gibbons Street, Plymouth, December 13, 1856.*

Larva of Celæna Haworthii.—In Mr. Stainton's 'Manual,' No. 9, he says "Larva undescribed. On cotton grass (*Eriophorum*). The larva is gray, spotted with black, feeds in the stems of *Eriophorum*; a small hole is made in the stem, from which the excrement is ejected in profusion; full fed end of July; in pupa three weeks."—*R. S. Edleston; Manchester, November 3, 1856.*

Capture of Heliophobus hispidus in Leicestershire.—In September last I was fortunate enough to procure a specimen of *H. hispidus* from a garden in this place: as the species as been so seldom met with, perhaps the notice of its occurrence in this central part of the kingdom may prove interesting to your entomological readers.—*A. G. Hildebrand; Kibworth, December 10, 1856.*

Eupithecia indigaria.—I met with this very distinct species on the boles of firs at the end of May.—*R. S. Edleston; Bowdon, November 4, 1856.*

Coleophora juncicolella.—This is not an uncommon species here, but, from their small size and colour, exceedingly difficult to secure in the long heather.—*Id.*

Bupalis incongruella.—I captured some twenty specimens in April, flying in the sun over heather, on Carrington Moss. I saw none unless birch trees were near; somebody may be fortunate enough to discover the larva.—*Id.*

Diplodoma marginepunctella.—Some ten specimens on the boles of oak and fir in July; the female covers her eggs with a thick coating of fur, in a similar manner to *Porthesia auriflua*.—*Id.*

Nemotois cupreacellus.—A few specimens of this brilliant insect occurred in July.—*Id.*

Tinea semifulvella.—I have taken a few of this fine species at rest on beech trees. I believe the larva will prove to be of a white colour, making galleries during winter and spring in the white fungus substance so often found on beech trees, forming, when full fed, a firm bag-shaped cocoon.—*Id.*

Crambus falsellus.—Occurs freely, but exceedingly local to a moss-covered wall; along with it occurs a *Gelechia*, very like *affinis*, but I think distinct, their habits are so different. *Affinis* is taken in the day time; not scarce at New Brighton: I never met with this species till after 10 p.m., at which time they come out of the crevices, and are then taken to be *in copulâ*: they occur here and also at Conway, N. Wales.—*Id.*

Depressaria angelicella.—I bred a series of this most variable species from larvæ found in the heads of *Epilobium*.—*Id.*

Larvæ of Nepticula at Bowdon, Cheshire.—During the last two months I have devoted some time to collecting the above larvæ: with few exceptions most of the species occur here: on horse-chestnut I found traces of a large miner; the tenants had left: I hope to be more fortunate another season. *Oxycanthella* occurs sparingly on hawthorn, apple and oak; abundant on mountain ash, which appears to be its favourite food: alder, birch, hawthorn, willow, sloe, beech, elm, oak, &c., each have produced their different tenants. On *Vaccinium Myrtillus* an amber-coloured larva makes a small mine at first and then blotches the leaf; when full fed it leaves the mine and spins a mussel-shaped cocoon, of a light brown colour, at the extreme broad end yellow: if I succeed in breeding this species I propose the name *myrtillella*. In the second number of the 'Substitute' is an account, by Mr. Douglas, of a swarm of *Septembrella* met with on the 19th of October: I first met with them on the 1st of October, some very small, others in the cocoon; on the 15th a similar swarm to Mr. Douglas's, and in all stages: they do not appear to frequent places where the *Hypericum* abounds, but prefer small patches. I have seen *malella* and *angulifasciella* swarm in a similar manner.—*Id.*

Captures of Micro-Lepidoptera at Darenth, &c., in 1856.—

Diplodoma marginepunctella. Among wild roses, June 22? two specimens, fine.

Tinea arceella. Old hedges. June 28, fine; July 13, wasted.

Nemophora Metaxella. Flying among low herbage. June 15, fine.

Adela Sulzella. Beat from hazel. June 22, fine.

Nemotois cupreacellus. On flowers of scabious. July 13, two females, fine.

„ *fasciellus*. On thistle blossoms. June 29, fine; July 16, wasted.

Anesychia decemguttella. Among *Lithospermum* (larvæ on same). June 22 and 29, and July 13, fine.

Enicostoma lobella. Among sloe. June 21, fine.

Depressaria carduella. Two specimens bred from larvæ found feeding on the under side of leaves of thistles. July 13.

Nothris durdhamellus. Bred first half of July from larvæ on *Origanum*; found June 22 and 28.

Cecophora tripuncta. Flying along hedges at 6 A.M. June 16, fine.

„ *Panzerella*. By beating. June 15, fine.

„ *tinctella*. By beating. June 15, worn.

Coleophora alcyonipennella. Larvæ on *Centaurea nigra*. June 10.

„ *palliatella*. Imago, July 12 and 16; larvæ spun up on oak and black poplar, June 22 and 29; bred July 12 and 14.

„ *currucipennella*. Two specimens bred July 14, from larvæ found spun up on oak June 22.

„ *albitarsella*. Larvæ plentiful on *Glechoma hederacea* May 11; a few on *Origanum*, June 10. Imago plentiful, June 15, by smoking.

„ ———? * Closely allied to *C. troglodytella*. I took several on the 1st of September among *Solidago virgaurea*, to which plant it is local, perhaps the solution of Enigma 24 in the 'Annual' for 1856: the forthcoming 'Annual' will probably throw some light upon the subject.

Elachista Treitschkiella. Larvæ in leaves of dogwood, July 16 and September 1.

„ *Gleichenella*. June 22, by beating, fine.

„ *Brunnichella*. Bred June 8, from a larva on *Origanum*; found May 4.

„ *albinella*? Among grass by sweeping. June 22, fine.

„ *triatomea*. In hedges among grass. July 13, fine.

Lithocolletis hortella. One on the stem of a cherry tree. May 11, fine.

„ *Nicelli*. Two among hazel. June 10, fine.

Bucculatrix frangutella. Among buckthorn. June 28, fine.

Nepticula Septembrella. Many larvæ in July; bred August 1 and 7, being the summer brood of this species.

Tinea ferruginella. Headley Lane. July 6, beat from juniper, fine.

„ *semifulvella*. On the Dartford Heath fence. June 22, fine.

Cerostoma nemorella. Wanstead Flats. One beat from honeysuckle. July 27, fine.

Gelechia gerronella. Wanstead Flats. Among fern, flying at dusk. July 23, worn.

„ *nigra*. Wanstead Flats. Two on trunks of aspen. July 27, worn.

Parasia carlinella. Bred beginning of August from thistle-heads collected in the Hilly Field at Headley Lane, April 20.

Sophronia parenthesella. Wanstead Flats. June 25, one, fine; July 23, many, mostly worn.

Cecophora flavifrontella. Wanstead Flats. Beat from hawthorn. June 1, fine.

Coleophora Genistæ. Wanstead Flats. One specimen by sweeping. July 23, fine.

* Head, face and palpi white; antennæ fuscous, annulated with white to within a short distance of the apex; basal joint slightly thickened. Anterior wings rather narrow, shining, grayish fuscous, with the costa, a streak along the fold, and two streaks towards the costa, rather broadly white. Posterior wings dark gray, with paler cilia. [If this be undescribed I would propose calling it *Coleophora Millerella*.—Ed.]

Elachista Poæ. Bred, first half of June, from pupæ collected at Temple Mills, May 25.

Lithocolletis emberizæpennella. Common on Wanstead Flats, May 25 and June 1.

Lyonetia Clerckella. Beat from juniper, Headley Lane. July 6, fine.

Opostega crepusculella. Common on Wanstead Flats. July 23, at sunset, running up blades of grass and taking short flights.—*C. Miller*; 17, *Silurian Terrace, Broke Road, Dalston*.

Correction of an Error.—My friend Mr. Stainton informs me my *Gracillaria Haighii* (Zool. 5295) is *Zelleria hepariella* of Mann.—*C. S. Gregson*; *Edge Lane, Stanley, November 10, 1856*.

Captures of Diptera in the New Forest, Hampshire.—As there appears but little notice in the 'Zoologist' respecting Diptera, I submit a list of captures in the neighbourhood of Brockenhurst, between the 8th and 16th of September last: nearly all were taken during sunshine, either on flowers or basking, so that remarks to each species are perhaps unnecessary. The list may include several that are common almost everywhere, but many are omitted for that reason. I did not observe any of the *Tabanidæ*: possibly I might have had some to record had I adopted a plan which was recommended,—namely, to take a quiet horse into the forest, tie him up to a tree, and stand ready, net in hand, to catch the flies that come to torment the animal!

Sciara Thomæ. Beaten out of oak.

Platyura laticornis. At an old stump, around which were growing some Fungi, inhabited by a species of *Phora*.

Ptychoptera contaminata.

Asilus cingulatus.

Dolichopus brevipennis.

Eristalis similis and *floreus*.

Xylota sylvarum and *nemorum*.

Paragus obscurus.

Melithreptus scriptus and *Menthastri*.

Conops flavipes and *quadrifasciata*.

„ *ceriæformis*. One specimen by Mr. Dyson, soon after I left.

Gymnosoma rotundata. One specimen among thistles.

Bucentes geniculatus.

Tachina fera. Abundant in company with *Sarcophaga carnaria*.

„ *bijuncta*.

„ *neglecta*. Worn.

„ *vulpina*.

Musca illustris, *vespillo*, *nitens*, *corvina*, *maculata*, and a species allied to *stabulans*, but the legs are wholly black; the third joint of the antennæ is ferruginous at the base, second black, and the eyes in the male are closer.

Anthomyia præterita, *testacea*, *depuncta*, *erratica*, *pagana*, *urbana*, *repulsa*, *pluvialis*, *præpotens*.

Dryomyza flaveola.

Tetanocera aratoria and *sylvatica*.

Sepedon sphegeus and *Hæffneri*. On rushes.

Gasterophilus Equi.

Hippobosca equina.—*Benjamin Cooke*; 49, *Ardwick Place, Manchester, December 4, 1856*.

The Sovereign Bee.—Some time ago I announced, on the authority of a correspondent, the capture of a new species of bee. I was told that five specimens were taken, and that a gentleman gave five pounds for them. Since this announcement I have been constantly applied to by letter for further particulars: as these applications continue to increase, I ask the favour of replying through the 'Zoologist.' I have again applied to my correspondent for information, who says, "With regard to the *Bombus* you enquire about, I can give no further information." Now here is a little information obtained,—I asked about a *bee*, and it turns out to be a *Bombus*. My object in this communication is principally to request the possessor of this valuable species to oblige the Hymenopterists of this country by publishing the name of the species: the possession of such a novelty must be a high gratification, and he may be assured that it will be greatly enhanced by making known to entomologists generally the collection which contains the treasure.—*Frederick Smith*.

Capture of Halictus maculatus at Sandown, Isle of Wight.—When at Sandown Bay, on the 21st of July last, I chanced to obtain *Halictus maculatus* among the Hymenoptera I captured there. I am indebted to my friend Mr. F. Smith, of the British Museum, for kindly naming it: in his 'Monograph' he states, "This very distinct and pretty little bee has only been twice captured."—*W. C. Unwin; St. Ann's, Lewes, December 8, 1856.*

Capture of Peryphus fluvialtilis and Tachys bistriatus.—In October last my brother and myself had the good fortune to capture several specimens of *P. fluvialtilis* on the banks of the Trent below Newark. This species has, I believe, been only once before taken in England, when it was found by Mr. Atfield, of Newark, near the same locality. I also this year met with *T. bistriatus*, in August, near Luccomb, in the Isle of Wight.—*A. Matthews; Market Harborough, November 29, 1856.*

Description of a Species of Bledius new to the British List.—I met with the under-mentioned species in the sands at Exmouth, under marine rejectamenta, on the 20th of September; they were found in company with *Broscus cephalotes*, *Calathus melanocephalus*, *Pogonus chalceus*, *Ophonus pubescens*, &c. The *Bledius* appear to be rare, at least I could not find more than five specimens; one male I sent to Mr. Westwood, and two pairs I have by me: it is undoubtedly a very distinct species, and a very rich addition to the small number of British species belonging to the genus.

BLEDIUS HISPIDUS, *Parf.*

Black; head very finely punctured. Thorax and elytra dark piceous, with numerous large shallow scattered punctures, and very thickly and finely punctured between; thorax with a smooth dorsal furrow; the elytra rather flat above, and depressed along the suture, the edges of which are slightly raised into a smooth ridge; apex of elytra slightly truncate. Abdomen margined, shining black, with a few largish depressions towards the apex of each segment, and very finely punctured between, the apex of each segment having a narrow, smooth, polished fascia. Antennæ and palpi rusty piceous; the apical joints of the latter having a dark annulus in the centre; mouth, legs and apex of abdomen pale ferruginous; the base of the femora darker. The male has a deflexed, finely punctured sharp horn on the anterior portion of the thorax, projecting slightly beyond the head; the apex testaceous and pilose. The whole insect clothed with short, stiff yellow bristle-like hairs, particularly on the thorax and elytra; those on the margins of the abdominal segments being longer than the rest. Length $1\frac{1}{4}$ line.

Female.—Differs in no respect from the male, with the exception of the thoracic

horn, the puncturing and colour being precisely the same in both. Length $1\frac{1}{4}$ line.—*Edward Parfitt*; 4, *Weirfield Place, St. Leonard's, Exeter, November 8, 1856.*

Capture of Polystichus fasciolatus, &c., near Eastbourne, Sussex.—In August last, whilst searching for Coleoptera near Eastbourne, I had the good fortune to find the rare and apparently very local *Polystichus fasciolatus* beneath a heap of chalk stones near the sea. Stephens records its capture in a similar situation on the Suffolk coast some twenty-eight years ago. I saw three; the first I most unfortunately crushed, in my eagerness to catch it; the next was secured, and is now in the cabinet of a London friend; the third made its escape beneath the stones and *débris*, and, although I searched the spot most diligently, I saw no more of them. Since then I have visited the locality and turned over the same heap of stones on two several occasions, but without any success. *Harpalus pubescens* was abundant in this locality. In addition to the above record, perhaps the following notice of a few captures, made during the past season in the neighbourhood of Lewes, will be acceptable, as it gives a new locality for the species, namely:—

Tarus axillaris, *Licinus depressus*, *Lebia chlorocephala*. Beneath chalk stones on the Lewes Downs in April, and again in September. Not scarce.

Stomis pumicatus. Occasionally in an old chalk-pit.

Anchomenus livens. At sugar placed on trees for *Noctuæ*, by a young friend, near the town, in September. Five specimens.

Stenolophus Skrimshiranus. By the side of a ditch, in profusion, near the town, in April.

Ochthebius exaratus, *O. æratus*. In the same ditch, in April, among aquatic plants.

Colymbetes conspersus. In a brackish pool near Newhaven, in August.

Philonthus corvinus, *Erich*. From moss near Newhaven.

Bembidium 5-striatum. Two specimens, Winterbourne, near Lewes.—*W. C. Unwin*; *St. Ann's, Lewes, December 7, 1856.*

Intricatus to be exhibited alive.—I propose sending up four living specimens of *Carabus intricatus* for exhibition at the next meeting of the Entomological Society: they were taken by myself under moss, in a wood in the neighbourhood of Plymouth, within the last month. This is one of those British insects captured by that celebrated naturalist Dr. Leach, the authenticity of which has been doubted, but why his word was not taken I am at a loss to know. Who has looked after this species in earnest? The answer is that no one has done so up to the present time. Collectors have paid flying visits of one or two days to this locality without finding it, but such visits without luck do not prove that certain things are not to be found in certain places.—*J. J. Reading*; 42, *Gibbons Street, Plymouth, December 13, 1856.*

Captures of Hydradephaga at York.—I send you the following list of *Hydradephaga* taken by me in Askham Bog, near York, during the present year. I ought to say that nearly all the insects were taken within a very small space of ground in the part more properly called Dringhouses Bog, and that the ponds which they frequent are apparently very old brick-pits. Of course I have omitted those species which are found everywhere.

Hydaticus transversalis. Very sparingly, and only in one spot, in August and September.

Colymbetes exoletus. Frequent.

„ *Grapii*. Frequent.

Ilybius ater. Common.

Ilybius obscurus. Common.

„ *guttiger*. Not frequent.

Agabus agilis. Sparingly.

„ *uliginosus*. Rare.

„ *abbreviatus*. Most abundant.

„ *affinis*. Very frequent.

Hydroporus decoratus. Very abundant during the present year, but hardly to be found last year.

„ *picipes*. A single example.

„ *rufifrons*. Frequent during the earlier months.

„ *nitidus*, *Sturm* (= *oblongus*, *Steph.*). Eight examples have occurred during the present year.

„ *memnonius*. Rare.

„ *Gyllenhalii*. Not frequent.

„ *tristis*. Occasionally.

„ *umbrosus*. Occasionally.

„ *angustatus*. Occasionally.

„ *obscurus*. Occasionally.

„ *Scalesianus*. Of this insect I have taken more than one hundred examples this year.

„ *granularis*. Frequent.

The names are according to Dawson and Clark's Catalogue.—*William Hey; Clifton, York, November 4, 1856.*

Note on Tomicus bidens, with a Description of Tomicus bispinus.—Recently, when looking over Mr. Guyon's description of *Bostrichus bispinus* (Zool. 4815), it occurred to me that the species there indicated was not *bispinus*, *Meg.*, but *bidens*, *Fab.* On turning to such books as were within reach I was confirmed in this opinion. Fabricius I have not. Panzer gives a figure of *bidens* (F. 39, f. 21), which, although somewhat rude, has the "claw-shaped" tooth, on the retuse part of the elytra, clearly defined. Gyllenhal, *Ins. Suec.* (iii. 357, 5), distinctly mentions the hook-shaped (*hamato*) tooth of the male. Stephens, both in his 'Illustrations' (iii. 357) and 'Manual' (1636), gives "a single large slightly bent tooth on the upper edge of the excavation," as the specific character. More recently, Bach, in his 'Käferfauna für Nordund Mittel-deutschland' (ii. 129), characterizes this species by the large claw-shaped tooth ("einem grossen, hakenförmigen, nach abwärts gekrümmten zahne"). Panzer, Gyllenhal and Bach alike find it in the bark of *Pinus sylvestris*, Gyllenhal remarking that it is found in the young branches of that tree. *T. bidens* is a common species in our district, principally affecting the Scotch pine, but in one or two instances I have taken it in larch: it prefers the shoots and tops of recently-felled young trees, in which it runs its galleries in all directions, generally commencing at the base of the twigs: a pair, male and female, seldom more, are found in each burrow: it occurs throughout the summer. I have, by the courtesy of a kind friend, a species of *Tomicus*, from the Isle of Wight, which I regard as the true *bispinus*, and not being aware of any English description of that species, I have attempted to supply the deficiency.

TOMICUS BISPINUS.

Bostrichus bispinus, *Megl., Bach Käfer.*, ii. 129, 9.

Cylindrical, brown, slightly glossy, rather thickly covered by a long griseous

pubescence; head closely and strongly punctured; antennæ pale testaceous; thorax a little broader than the elytra, widest in front, where it is rugose and much punctulated, smooth and less sculptured behind; elytra distinctly punctured, punctures in lines; having a sutural stria, nearly obsolete on the disk, and gradually widening as it approaches the apex, which is rounded in the female; in the male the apex of the elytra is broadly retuse, with two stout acute teeth on the upper and outer edge. Length $1\frac{1}{2}$ — $1\frac{3}{4}$ line.

Differs from *bidens* in being more elongate, paler in colour, more pubescent, without the distinct thoracic line, and the retusion of the elytra is broader, with the teeth acute and further apart.

In the stems of *Clematis vitalba*, rather plentifully. Isle of Wight.—*Thomas John Bold*; *Long Benton*, Newcastle-on-Tyne, December 15, 1856.

PROCEEDINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY.

November 3, 1856.—W. W. SAUNDERS, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—‘Papers and Proceedings of the Royal Society of Van Dieman’s Land,’ Vol. iii. Part I.; presented by the Society. ‘Journal of the Proceedings of the Linnean Society,’ Vol. i. No. 3; by the Society. ‘Entomological Papers, being Descriptions of new Ceylon Coleoptera, with such Observations on their Habits, &c., as appear in any way interesting,’ by John Nietner, Colombo, Ceylon, Nos. 1 and 2; by G. H. K. Thwaites, Esq. ‘Bericht über die Oesterreichische Literatur der Zoologie, Botanik und Palæontologie aus den Jahren 1850, 1851, 1852, 1853,’ ‘Verhandlungen des Zoologisch-Botanischen Vereins in Wien,’ Band V.; by the Society. ‘The Natural History Review,’ No. 12; by the Dublin Natural History Society. ‘Entomologische Zeitung, 1856,’ Nos. 7, 8, 9 and 10; by the Entomological Society of Stettin. ‘A Manual of British Butterflies and Moths,’ No. 9; ‘The Substitute,’ Nos. 1 and 2; ‘Elements of Entomology,’ by W. S. Dallas, F.L.S., No. 2; by H. T. Stainton, Esq. ‘The Athenæum’ for October; by the Editor. ‘The Literary Gazette’ for October; by the Editor. ‘The Zoologist’ for November; by the Editor. ‘The Journal of the Society of Arts’ for October; by the Society. A specimen of *Belostoma* sp.—? by James Weston, Esq.

Election of a Member.

George Edwards, Esq., of 24, Acacia Road, St. John’s Wood, was balloted for and elected a Member of the Society.

Exhibitions.

Mr. A. F. Sheppard exhibited *Acronycta Alni* and *Phibalapteryx gemmaria*, taken near Brighton.

Mr. Stevens exhibited a fine specimen, in its natural state, of the wax secreted by *Coccus pela*, or wax-insect of China, sent to him by Mr. Fortune.

Mr. Westwood said this *Coccus* was a subject of considerable interest, as we thus were able to see from what the Chinese wax is produced; it is the covering formed by the female of a species of *Coccus* called by the Chinese *pela*, whence the specific name applied to it: its chemical properties had lately been investigated by Mr. Daniel Hanbury, who had recently exhibited some very fine specimens. In some of the wax sent home by Mr. Fortune he (Mr. W.) had found the remains of male insects, and also two species of *Chalcidæ*, which were doubtless parasites of the *Coccus*.

Mr. Bowring observed that this wax was used in China to coat over the outsides of the candles made from the candle tree, in order to give them a hard surface.

Mr. Stevens exhibited a full-grown larva of *Agrotis Ashworthii*, remarking that it was one exhibited by him at a previous meeting, when but a few days old; also the bottle containing liquorice-powder exhibited at the last meeting, in which were specimens of *Endrosis fenestrella* still alive.

Mr. Stainton exhibited, on behalf of Mr. H. Cooke, a specimen of *Leucania vitellina*, a *Noctua* new to Britain, taken by him in his own garden at Brighton; also *Phlogophora empyrea*, *Leucania musculosa* and *Laphygma exigua*, all taken near the same locality during this season, and a specimen of *Cucullia Verbasci*, reared from larva which had been found feeding on *Budhlæa globosa*.

Mr. Douglas exhibited two specimens of *Brontes planatus*, *Lin.* (*Uleiota planata*, *Steph. Man.*), which he had taken on the previous day under the loose bark of a lime tree, in the neighbourhood of Lee, which had been felled about a year ago; and observed that the species is given by Stephens as "very rare, Hermitage, South Lambeth," and that Shuckard says, "very rare, query indigenous," so that the capture is of interest in more ways than one.

Mr. Stainton exhibited the cocoon of a species of *Tinea*, from Ceylon, attached to a footstalk about half-an-inch long, the cocoon itself being composed of network, similar to those of the European genus *Plutella*.

Mr. Westwood observed that a much more remarkable instance of the cocoon of a Lepidopterous insect being attached to a footstalk occurs in the *Saturnia Cynthia* of India, in which species the footstalk of the cocoon is two inches long.

Mr. Stevens exhibited the following Coleoptera, recently taken by Mr. Arthur Adams:—*Polistichus fasciolatus*, at Sheerness; *Trechus nanus*, at Mickleham; also six specimens of *Drypta emarginata*, and a larva which he presumed pertained to the latter species.

Mr. Westwood observed that the larva referred to *Drypta* was, in reality, that of a species of *Silpha*.

Mr. Weir exhibited a specimen of *Anthrribus albinus*, captured at Pembury, Kent.

Mr. Foxcroft exhibited some Coleoptera and Lepidoptera, taken in Scotland and Wales during the past summer, including a single specimen of *Otiiorhynchus septentrionis*, from Perthshire.

Mr. F. Smith exhibited a specimen of *Cybister limbatus*, having the head of the larva instead of that of the perfect insect; it was found alive and swimming, in apparent health, by Mr. Bowring, at Hong Kong.

Mr. Westwood said this was the first recorded instance in Coleoptera of the imago being found with the head of the larva; in Lepidoptera, however, instances had

occurred : a specimen of *Nymphalis Populi* was recorded in the 'Memoires de l'Academie Royale de Bruxelles,' having the head of the larva instead of that of the perfect insect.

Mr. Gregson sent for exhibition a pair of *Coleophora vitisella*, and the case of the larva of this species.

Mr. Stevens read an extract from a letter received by him from Mr. A. R. Wallace, written from Lombock, in which he remarked the paucity of insects of all orders in that locality, attributable to the greater part of the island being now devoted to the cultivation of rice.

The Secretary read the following extract from a letter from G. H. K. Thwaites, Esq., Director of the Botanic Garden, Peradenia, Ceylon, to William Spence, Esq.:—

"I have often observed, on the whitewashed walls of the houses here, a whitish-coloured spider stationary for hours, with its head downwards and its legs extended (a pair of intermediate ones much shorter than the others), and two long spinnerets; but it was only a short time ago I had an opportunity of observing the curious mode in which it entraps its prey. When an insect makes its appearance on the wall near it, it commences running round and round it with the greatest rapidity, spinning a web all the time, which confines the legs, wings, &c., of the poor victim most effectually, and has just the effect of a lasso thrown over its limbs. With this knowledge of the spider's habits we can understand the use of the long spinnerets, and that the short pair of legs enable it to make a more rapid and smaller series of turns round its victim."

Mr. Westwood had great pleasure in stating that it was the intention of Messrs. Saunders and Hewitson to commence the publication of a second volume of their splendid work on 'Exotic Butterflies.'

Part II. of Vol. iv. of the New Series of the Society's 'Transactions,' published in October, was on the table.—E. S.

Inquiry respecting Serpula contortuplicata.—I should be very much obliged if any of your readers would state whether it is a common occurrence for the *Serpula contortuplicata* to shed, or cast away, the trumpet-shaped operculum with which it is furnished: this happened a week since to a very fine specimen in one of my tanks, and although I feared that it was a precursor of death, as yet the gills protrude as strongly and the animal seems as sensitive as before the loss of the operculum, which now lies at the bottom of the tank an object of great beauty.—C. R. Lighton; Ellastone, November 29, 1856.

Proceedings of Natural-History Collectors in Foreign Countries.

MR. A. R. WALLACE.*—"Ampanam, Lombock, August 21, 1856.—Another month has passed since I wrote to you, and there is still no chance of a passage to Macassar; having missed one opportunity by

* Communicated by Mr. S. Stevens.

being away from the village, I am afraid to go out in the country any more, and here there are nothing but dusty roads and paddy fields for miles around, producing no insects or birds worth collecting: it is really astonishing, and will be almost incredible to many persons at home, that a tropical country when cultivated should produce so little for the collector: the worst collecting-ground in England would produce ten times as many species of beetles as can be found here, and even our common English butterflies are finer and more numerous than those of Ampanam in the present dry season; a walk of several hours with my net will produce perhaps two or three species of *Chrysomela* and *Coccinella*, and a *Cicindela*, and two or three Hemiptera and flies; and every day the same species will occur. In an uncultivated district which I have visited, in the south part of the island, I did indeed find insects rather more numerous, but two months' assiduous collecting have only produced me eighty species of Coleoptera! why there is not a spot in England where the same number could not be obtained in a few days in spring. Butterflies were rather better, for I obtained thirty-eight species, the majority, however, being Pieridæ; of the others, *Papilio Peranthus* is the most beautiful.

"The birds have, however, interested me much more than the insects, as they are proportionably much more numerous, and throw great light on the laws of geographical distribution of animals in the East. The Islands of Baly and Lombock, for instance, though of nearly the same size, of the same soil, aspect, elevation and climate, and within sight of each other, yet differ considerably in their productions, and, in fact, belong to two quite distinct zoological provinces, of which they form the extreme limits. As an instance, I may mention the cockatoos, a group of birds confined to Australia and the Moluccas, but quite unknown in Java, Borneo, Sumatra and Malacca; one species, however (*Plyctolophus sulphureus*), is abundant in Lombock, but is unknown in Baly, the island of Lombock forming the extreme western limit of its range and that of the whole family. Many other species illustrate the same fact, and I am preparing a short account of them for publication. My collection here consists of sixty-eight species of birds, about twenty of which are probably not found west of the island, being species either found in Timor and Sumbawa or hitherto undescribed. I have here, for the first time, met with many interesting birds, whose structure and habits it has been a great pleasure to study, such as the Artamidæ and the genera *Ptilotis*, *Tropidorhynchus*, *Plyctolophus* and *Megapodius*.

"The islands of Baly and Lombock are inhabited by Malayan races, closely allied to the Javanese. Baly has several rajahs, who are under the protection of the Dutch; Lombock has one rajah, who governs the whole, and is quite independent. These two islands are wonderfully cultivated,—in fact, they are probably among the best cultivated in the world: I was perfectly astonished when, on riding thirty miles into the interior, I beheld the country cultivated like a garden, the whole being cut into terraces, and every patch surrounded by channels, so that any part can be flooded at pleasure; sometimes a hollow has the appearance of a vast amphitheatre, or a hill-side of a gigantic staircase, and hundreds of square miles of an undulated country have been thus rendered capable of irrigation, to effect which almost every stream has been diverted from its channel and its waters distributed over the country. The soil is a fine volcanic mould of the richest description, and the result of such a mode of cultivation is an astonishing fertility; the ground is scarcely ever unoccupied; crops of tobacco, Indian corn, sugar cane, beans and cucumbers, alternate with the rice, and give at every season a green and smiling appearance to the island: it is only on the summits of the hills and on the tops of the undulations, where water cannot be brought, that the ground is left uncultivated, but in these places a short turf gives food to the cattle and horses, which are very abundant, and clumps of bamboos with forest and fruit trees have all the appearance of an extensive park, and a pleasing contrast to the more regularly cultivated districts. I have been informed by parties capable of forming a judgment that in the best cultivated parts of Java so much labour has not been expended on the soil, and even the industrious Chinese can show nothing to surpass it: more than half the Island of Lombock consists of rugged volcanic mountains, which are quite incapable of cultivation, yet it exports more than 20,000 tons of rice annually, besides great quantities of tobacco, coffee, cotton and hides. Our manufacturers and capitalists are on the look-out for a new cotton-producing district: here is one to their hands. The islands of Baly, Lombock and Sumbawa can produce from ten to twenty thousand tons of cotton annually; it costs here uncleaned about $1\frac{1}{2}$ cent a-pound; the qualities are various,—some, I believe, very good, so it can easily be calculated whether, after cleaning, it would pay.

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"A. R. WALLACE."

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